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INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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ORIGINAL COMMUNICATIONS.

THE MODERN METHOD OF TREATMENT OF DISEASES OF THE STOMACH.[1]

BY JULIUS FRIEDENWALD, M.D.,

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When your secretary requested me to present a paper on "The Modern Method of Treatment of Diseases of the Stomach from the Standpoint of the General Practitioner" to your Association, I consented with some reluctance, for I at once recognized the difficult task set before me. The treatment of any disease, especially of the stomach, presupposes a thorough knowledge of the disease at hand, and this is not always a simple matter, for a correct diagnosis is often most difficult and at times impossible. The treatment follows the diagnosis directly, and most of our therapeutic failures are due to inaccurate diagnoses. It is therefore of the utmost importance to examine all of our patients affected with gastric disorders most thoroughly, and to exercise every precaution to reach correct diagnoses. It is only under these conditions that the treatment may be so instituted as to prove most effective, and of the greatest benefit to the patient.

The specialty of gastroenterology really dates as far back as the beginning of the eighteenth century, when the stomach-tube first saw the light of day. There has been much discussion as to the priority of the discovery of the stomach-tube, and the view has been generally accepted that this instrument is of English origin, and that the two English surgeons, Jukes and Bush, are its inventors. This claim is based on an article by Jukes in the London Medical Repository of 1822. He here described an elastic tube one-quarter of an inch in diameter and two and a half feet in length, terminating at one extremity in a small globe of ivory with several perforations; the other extremity being adapted either by screw or plugs to an elastic bottle of sufficient size to contain at least a quart of liquid, and having a stop-cock fitted to it. Instead of the bottle a syringe of an equal capacity could be adapted in the same manner to the flexible tube.

Some years ago, in looking over some old medical volumes, my attention was attracted to the fact that the credit of this discovery is due to Dr. Physick, who published his original paper October, 1812, in "The Electric Repertory," Vol. III, page iii, under the title of "Account of a New Mode of Extracting Poisonous Substances from the Stomach, by Philip S. Physick, M.D., Professor of Surgery in the University of Pennsylvania," which is ten years prior to the appearance of Jukes's article. He declares that he employed the tube in washing the stomach of twins three months old who had accidentally been given an overdose of laudanum by their mother. He employed a large catheter for this purpose. One of the children was saved, the other died. Physick states that the idea of washing out the stomach with a syringe and tube in cases in which quantities of laudanum or other poisons had been swallowed occurred to him at least twelve years before, and he had constantly for many years recommended it in his lectures. In the year of 1809 his

[1] Read by invitation at the meeting of the York County Medical Society (Pennsylvania), Nov. 4, 1915.

nephew Dr. Dorsey practiced lavage in a case, but the patient had swallowed the poison twelve hours before he was called, so that he did not succeed in saving life. But the tube was soon forgotten, and was not generally employed until after 1869, when Kussmaul suggested its use in the treatment of gastric dilatation.

No one who is especially interested in the treatment of diseases of the stomach should fail to read that most important article, "Uber die Behandlung der Magenerweiterung durch eine neue Methode mittest die Magenpumpe," by Kussmaul, in the *Deutsches Archiv für klinische Medicin* in 1869, in which a most ingenious method of treatment laid the foundation for an exact mode of diagnosis in gastric disturbances. In this valuable paper Kussmaul tells of the difficulties besetting the treatment in advanced forms of dilatation of the stomach due to narrowing and closure of the pylorus. "Very exceptionally was it possible to obtain any results in the treatment of this dreadful disease. As a rule it may hardly be possible ever to expect an amelioration of the symptoms, and never possible to produce a cure." Kussmaul, who was director of the Freiburg Medical Clinic, was rather reluctant in admitting to his clinic a country girl, Marie Weiner, twenty years of age, who had been troubled with gastric disturbances for eleven years, and in whom he found a typical example of dilatation of the stomach, produced by stricture at the pylorus due to ulcer. The patient was very pale and emaciated, and so weak as to be unable to leave her bed; she suffered greatly from vomiting of extremely large quantities; from gastric pain, sleeplessness, and attacks of tetany, and was relieved of her suffering only by means of morphine. Kussmaul says: "Often when I observed the patient in the wretched prodromal stage of vomiting the thought had occurred to me that I might relieve her suffering by the employment of the stomach-pump, as the removal of large masses of decomposed acid gastric contents should cause relief from agonizing burning and retching at once. The introduction of the sound could be performed without difficulty, for where a gastric dilatation has existed for so long a period of time the esophagus is usually dilated. The artificial emptying of the stomach by the pump could be no more painful or distressing than the condition existing before and during vomiting; at any rate, its effect would be more rapid and complete than the emptying of the stomach by means of vomiting, with its prolonged prodromal stage of nausea, pain, and retching. Often, even after vomiting, palpation and percussion indicated that the stomach still contained considerable masses of contents. This condition reminded me of the so-called ischuria paradoxa, in which large amounts of urine flow daily from the dilated bladder without its actually emptying itself and without reducing its size. By means of the pump it is possible to empty the stomach completely, and, if its elastic and contractile powers have not been entirely lost, perhaps even give to it the tone to contract to a certain degree, as the catheter occasionally brings about recovery in ischuria paradoxa.

"In our patient the gastric dilatation was occasioned by stricture at the pylorus. At the post-mortem examination of cases of extreme gastric dilatation, I have repeatedly found that the stenosis which was present would still admit the passage of a small finger from the stomach into the duodenum, although there had appeared to be complete closure of the pylorus towards the end of life. In such cases I had at times observed at the bedside through the abdominal walls active movements of the stomach. It appeared to me as though the excessive distention, the filling and overloading of the stomach itself, produced a mechanical action which increased the constriction of the pylorus to complete closure. I was desirous of removing this condition by emptying the stomach and decreasing its size. Finally, it appeared to me that the use of the stomach-pump would permit a more thorough treatment of the diseased gastric mucous membrane than was ever before accomplished. In the case of our patient this had for 2½ years been constantly irritated by extremely acid contents. The

stomach-pump would not only make it possible completely to evacuate these acid acrid masses, but would permit the washing and cleaning of the diseased mucous membrane, which had been irritated by acids with alkaline fluids, as with Vichy water or with an artificial soda solution. The introduction of the stomach-tube, the pumping out, and washing with Vichy water were usually easy. We withdrew three liters of acid, dirty-gray, sarcina-containing fluid, with particles of food of all kinds undergoing softening and decomposition." This was first accomplished on July 22, 1867.

Although most enthusiastic over this new method of treatment, Kussmaul realized its limitations. He recognized that only where slight constriction of the pylorus existed was he able to cure cases of dilatation of the stomach by lavage. In cases of malignant stenosis of the pylorus and marked cicatricial contraction relief only could be afforded, and not cure. He says: "Naturally it is impossible to expect a cure of a dilated stomach by means of lavage when the pyloric orifice is narrowed to such an extent that it will hardly admit even as much as a goose quill." It is here that Kussmaul points out the possibility that surgery may at some future day bring relief to these cases, and it is possible, as Fleiner suggests, that perhaps it may have been the inspiration of this remark that led Billroth at a not very distant date to attempt to cure incurable forms of gastric disease by surgical measures. Thus a new method of treatment, this epoch-making work of the great master Kussmaul, furnished the impetus for the study of gastric diseases according to modern scientific methods and led to the stomach-tube, not only as a new method of treatment but also of diagnosis.

A year later (1870) Jurgensen pointed out the disadvantage of the stomach-pump, as recommended by Kussmaul. The pump is difficult to cleanse, and in fact its use is superfluous. Jurgensen here introduces the principle of siphonage into the practice of gastric lavage, which entirely eliminates the use of the pump in this form of treatment. The soft-rubber tube is also here recommended, and Jurgensen fully explains the method of introduction of the stomach-tube, the position to be assumed by the patient, as well as of practicing the siphonage in freeing the stomach of its contents. This contribution must be classed as an advance in the therapeutics of gastric diseases. Jurgensen utilized the rubber tube terminating in a perforated ivory bulb. The bulb was guided by means of wire stylet. Four years later (1875) Ewald called attention to the fact that any rubber tubing having sufficient resistance could be introduced into the stomach without the use of a guide.

While Kussmaul drew attention to the therapeutic value of the stomach-tube, it remained for Leube at the Rostock Naturforscher Versammlung in 1871 to point to the value of the stomach-tube as a diagnostic measure.

Twelve years later (1883) Leube established his test meal as a means of determining that a normal stomach should be empty seven hours after the ingestion of a meal of water, soup, steak, and bread. It was not long after (1883) that Leube developed his well-known scale of the digestibility of various foods, which he earnestly advocated as a means of diet in the treatment of ulcer of the stomach. He divided the various foodstuffs, according to their digestibility, into four classes. This work is most valuable, pointing as it does to the importance of diet in gastric diseases, and marked an advancement in the therapeutics of diseases of the stomach.

From this time on the stomach-tube has been generally utilized not only for diagnostic but also for therapeutic purposes, and many modifications of this instrument have been devised. As with all other therapeutic measures, when employed without proper indications, the use of the tube has often been abused, and on this account has often fallen into disfavor, for lavage has frequently been practiced as a last resort, often after all other therapeutic measures have failed, and without proper indications. The therapeutic indications for lavage are definite. This procedure should be practiced for the removal of decomposing foods

and excessive secretions in cases of dilatation due to pyloric or duodenal obstruction, and in cases of fermentation, as is observed in chronic gastritis and in cancer; for the removal of mucus in chronic gastritis, and of excessive acid secretion. It is a most useful and life-saving procedure for the quick extraction of poisons which have been swallowed, as well as in removing the intestinal regurgitations occurring in obstructions of the bowels. In other conditions its use may at times prove beneficial; it then acts often only as a suggestive measure.

Among the modifications of the tube occasionally employed are the gastric douche, gastric spray, and powder-blower. The douche is used for treatment of the mucous membrane of the stomach. It consists of a tube with small-sized apertures, through which a fine stream flows stimulating the mucous membrane; the fluid employed may consist of Vichy water or a bitter tonic such as quassia, calumba, etc.

The spray of Einhorn is utilized for the instillation of small quantities of fluid into the stomach. The fluid introduced is usually a solution of nitrate of silver (.1-.2 per cent), which is employed in certain forms of chronic gastritis and in hypersecretion. Another apparatus of some importance introduced by Einhorn is the intragastric electrode used to apply electricity directly into the stomach.

Usually the intraventricular application of electricity is more beneficial than the extraventricular. The faradic current is especially useful in cases of gastric atony, and in some forms of gastric neuroses. The galvanic current is beneficial in painful gastric conditions, such as in gastralgias and pylorospasm.

DIET IN DISEASES OF THE STOMACH.

In diseases of the stomach the selection of a proper diet is often of more importance than the choice of drugs. No absolute dietetic regulations can be formulated in this class of diseases, but it is important to regulate the food in conformity with the particular disease with which the patient is affected, and also to consider the individual tastes and peculiarities of the patient. Even in the regulation of a diet in any special disease of the stomach, changes are often rendered necessary; these must be made gradually and according to the patient's powers to digest the food.

Food is said to be easily digestible when it produces no gastrointestinal discomfort, is passed from the stomach into the intestine at a normal rate of speed, and is easily absorbed. Under normal conditions the digestibility of foods is easily ascertained, for the functions of the stomach being normal, the effect of the food upon the functions can readily be determined; in the various gastric disturbances, however, this problem is more difficult. In determining the diet for a special gastric disturbance two points must be borne in mind: first, the power to increase the nutrition of the patient; and secondly, the necessity of giving food in a digestible form so as to lessen the work of the stomach. It must be borne in mind that the digestibility of food varies widely with the individual taste, for no matter how digestible a food may be, if it is unpalatable it will not be digested properly. In general it may be said, first, that in acute conditions the food should be of such a character that the stomach should be spared as much work as possible; second, in chronic disturbances it is important to supply sufficient quantities of nourishment in an easily digestible form, so as to maintain the body weight so far as possible. In determining the quantity of food that is necessary during twenty-four hours, the amount is estimated in calories of heat. As is well known, a human being at rest requires 35 calories per kilo of weight, whereas while he is performing light work he requires 40 calories. In order, therefore, to determine the exact amount of nourishment, it is only necessary to know the weight of the individual. Inasmuch as the proteins can be replaced in a measure by the carbohydrates and fats, an interchange of any of these three food elements can be made according to the patient's condition. When the weight of the person is known, it is an easy matter to determine whether the amount of nour-

ishment given is sufficient to maintain the body weight.

It is well also to weigh every patient suffering with a stomach disorder when treatment is first inaugurated, and to repeat this from time to time, in order to determine whether the patient is gaining or losing flesh.

The diet must be considered from the standpoint of the gastric secretion; there may exist, on the one hand, the condition of oversecretion of acid, and on the other, lessened secretion or absence of acid.

In cases of oversecretion an abundant protein diet is indicated, inasmuch as the excess of hydrochloric acid is neutralized by this class of foods. Ordinarily, the proteins that are best adapted for patients suffering from oversecretion of acid are the red meats and eggs, whereas the carbohydrates must be given in the most easily digested form.

In cases in which there is a diminution of the gastric secretion the protein foods are digested with difficulty, whereas the carbohydrates are more easily digested. In this condition, therefore, only very tender meats, preferably scraped, are to be given; whereas such easily digestible vegetables as spinach, mashed potatoes, and farinaceous foods may be eaten in quite large quantities. In both conditions of increased and diminished secretion of acid a reasonable amount of fat must be eaten, preferably in the form of good butter. The diet in muscular disturbances of the stomach depends greatly upon whether an excess or a deficiency of gastric juice is secreted; if there is an increase, an excess in protein food gives the best results; if, on the other hand, there is a diminution of this secretion, protein food must be given the patient in the most easily digestible form. The carbohydrates and the lighter vegetables may be given in somewhat larger proportion. In both conditions the ingestion of fluids should be reduced as far as possible. Normally, the appetite is a fair indication of the number of calories of heat that may be required; in conditions of gastric disorder, however, this is not the case; these patients lose their appetite, and consequently often take insufficient food. In those instances in which the gastric disorder is somewhat protracted and accompanied by great loss of weight, and in which the patient takes insufficient nourishment, it need only be remembered that such a patient resting quietly in bed requires quite a number less of calories than a patient who is not resting. This plan is therefore often taken advantage of in the treatment of many patients suffering from disorders of the stomach.

SPECIAL FACTORS BEARING ON THE DIET IN PATIENTS SUFFERING FROM GASTRIC DISTURBANCES.

1. Von Noorden demonstrated the fact that the intestine will vicariously perform the work of the stomach in conditions in which the secretion of the latter is lost. The point to be borne in mind is that even in cases in which the secretion of the stomach is lost entirely, the intestine may assume this function of the stomach.

2. In those cases in which it is necessary to spare the stomach, as when food cannot be digested or is vomited, either predigested foods may be utilized or foods may be administered through channels other than the stomach.

3. The following rules for eating should be carried out:

(*a*) Food should be thoroughly masticated; this is especially important in those cases in which there are marked gastric disturbances.

(*b*) The meals should be taken at regular intervals and in moderate quantities, according to the nature of the gastric disease.

(*c*) The temperature of the food is also an important factor in the treatment of gastric disturbances; as Uffelmann has pointed out, the food should be taken at a temperature between 98° and 100° F. The ingestion of very hot food is believed to be a frequent cause of ulcer and, as Mayo has recently pointed out, a factor in the production of cancer of the stomach. On the other hand, Wegele attributes the dyspepsia of many Americans to the taking of ice-cold water and other cold drinks.

(*d*) The question of rest or exercise after eating is one that is of considerable importance to those suffering from gastric disturbances. It is generally admitted that violent exercise should not be indulged in after eating.

From my own observations, it appears that in conditions of gastric disturbances accompanied by increased or decreased acidity, and in muscular disturbances of the stomach, the gastric digestion is improved during rest, but impaired by sleep after meals.

Among the special forms of treatment recommended in gastric disturbances may be mentioned the rest cure, first devised by Weir Mitchell. This treatment is especially useful in cases of nervous stomach disorders. It is also useful in the treatment of ulcer, gastritis, and other conditions. The rest treatment in gastric disorders should be carried out for a period of from six to eight weeks. The patient should be confined to bed a large part of this time and given a varied diet, food being supplied every two to three hours. Boas advises that instead of the large quantities of milk usually prescribed, the patient will do better if given ½ to 1 liter of cream daily in portions of 150 to 200 Cc. In addition to the protein food he advises a diet rich in carbohydrates and fats. Constipation may be overcome in most instances by the addition of such foods as honey, preserves, buttermilk, kumiss, and kefir. The results that follow this plan of treatment are often marvelous. In referring to the question of diet, I cannot pass by this subject without touching upon the question of the use of Bulgarian buttermilk, of recent introduction in America, but long used in the Orient. The importance of this form of milk, and its high nutritive value, was first recognized by the Bulgarian physician, Grigoroff, and more recently by the French physicians. It contains three forms of bacteria, the most important one being the bulgaricus, causing the acidulation of the milk. The organism produces a fermentation of the sugars and causes the coagulation of the milk, forming lactic acid. The Bulgarian buttermilk is exceedingly digestible, due to the fact that its casein and albumin are rendered soluble. Metchnikoff ascribes a life-prolonging effect to this milk, due to the fact that in Bulgaria, where this form of milk is employed as a regular article of diet, there are many individuals above 100 years of age.

There can be no question but that the decomposition effect in the intestine is favorably affected by the Bulgarian milk. Tablets containing the Bulgarian bacilli are detailed by various pharmaceutical establishments and have been highly recommended. Another food employed in recent years to a very large extent in the treatment of gastric disorders is olive oil. This substance has been most satisfactorily used in the treatment of ulcer and other gastric disorders, and is of great value both as a food and as a remedy.

In this connection I must call your attention to an oil recommended in the last few years by Lane—paraffin oil, a mineral oil, which is now very largely employed with most beneficial results in the treatment of intestinal stasis. This oil is not a food, however, as it passes unchanged through the intestinal tract.

Certain advances have been made in the medical treatment of ulcer of the stomach in the past few years. According to the older plan, the Leube treatment was almost constantly followed. This consists of placing the patient at complete rest in bed for fourteen days or more, upon liquid diet mainly of milk. Upon such a diet the patient frequently loses much flesh as well as strength.

On this account Lenhartz cautions against the strict abstinence diet in the treatment of ulcer of the stomach, even in those instances in which there is hemorrhage. He bases his conclusions on the fact that since ulcer of the stomach is most frequently accompanied by superacidity and also by an enfeebled condition, it is best to give protein food early to overcome the acidity as well as to build up the system.

In the Lenhartz cure, absolute rest in bed for at least four weeks is maintained. An ice-bag is placed on the abdomen, and left on more or less continually for two weeks. On the first day, even though there be

hematemesis, 200 Cc. of iced milk are given in teaspoonful doses together with two raw, ice-cold, beaten-up eggs.

The eggs are beaten up with sugar, and they are kept cold by placing the cup containing them in a dish filled with ice. The milk is increased every day 100 grammes, and one additional egg added; on the ninth day the patient is given 1 liter of milk, and the quantity is not increased; on the sixth day raw scraped beef is added, and the quantity is doubled on the following day; on the seventh and eighth days the patient is given some well-cooked rice and zwieback (softened); and on the tenth day raw ham and butter.

Only recently Sippy has evolved a method of treating peptic ulcer which seems likely to replace all other methods of treatment. The treatment consists in protecting the ulcer from the acid corrosion until it has healed, by shielding it from the corrosive effect of the gastric secretion.

He accomplishes this by maintaining a neutralization of all free HCl from early in the morning until late at night. This is effected by frequent feedings and the use of alkalies given frequently. The patient remains in bed for three to four weeks. Three ounces of a mixture of equal parts of milk and cream are given every hour from 7 A.M. to 7 P.M. After two or three days soft eggs and well-cooked cereals are gradually added until in ten days the patient receives 3 ounces of milk and cream mixture every hour, three soft-boiled eggs and 9 ounces of a cereal each day. Cream soups of various kinds, vegetable purées, and other soft foods may be substituted now and then as desired. Powders of magnesia and soda and bismuth and soda are given between the feedings to neutralize the acid secretion. The details of the treatment can be found in a recent number of the *Journal of the American Medical Association.*

I have been employing this method in the treatment of a large number of cases of peptic ulcer with most gratifying results.

Of the greatest importance in the treatment of certain cases of ulcer is the method devised by Einhorn, known as duodenal alimentation. By means of this method food can be introduced directly into the duodenum. The instrument employed consists of a small capsule perforated and attached to a long rubber tube, at the other end of which a syringe can be applied. The tube is swallowed while drinking water, and the instrument soon passes into the stomach, and within an hour or two into the duodenum. Care should be taken to see that it is in place before the feeding is started. This may be done by gentle traction, which shows a slight resistance if the tube is in the duodenum; by aspiration, which will often bring up golden-yellow duodenal juice without any gastric secretion; or, perhaps best, by giving the patient some liquid to drink by mouth and immediately performing aspiration. If the end of the tube is in the stomach, the fluid can be removed. Any liquid food may be employed, but mixtures of milk-sugar and raw eggs are the most useful. Care should be taken to see that there are no particles in the food that might clog the tube. The amount at the beginning should be small, 100 Cc. every two hours, beginning early in the morning and stopping late in the evening. This quantity may be gradually increased up to 300 Cc. If eight feedings are given in twenty-four hours and each feeding consists of 280 Cc. of milk, one egg, and one tablespoonful of sugar of milk, the patient will receive approximately 2280 calories, which is ample for an average individual, and if the patient is at rest in bed it is sufficient to allow a gain in weight.

Einhorn has perfected a special syringe, with which it is possible to administer the food without disconnecting the tube. Morgan has suggested a method like that of Murphy for giving salt solution per rectum, permitting the fluid to flow from an irrigating jar, and so arranging the pet-cock that the food is taken slowly, the 300 Cc. of nourishment taking about twenty-five minutes. The food should be administered at body temperature and the heating should be done slowly, for if it becomes too hot it is liable to become thick and lumpy. After heating, it is well to strain the food to be certain to have it free from small particles. If the food is used too warm or too cold it

is apt to cause uncomfortable symptoms, sometimes causing the patient considerable shock; a too rapid administration causes flatulence. After each feeding a syringeful of water at 98° F. should be injected, then the pet-cock closed and the syringe filled with air, which should be injected after the pet-cock has been opened; the pet-cock should then be closed and the syringe disconnected. This procedure is very important, and serves to keep the tube clean and empty.

Of the many remedies employed in the treatment of the various gastric disorders there is one of unusual importance, as it appears to have an almost specific effect in certain conditions. The drug is atropine, which by depressing the vagus fibers decreases the secretory and motor functions of the stomach. Through the researches of Eppinger and Hess, the theory has been advanced that disturbances of the autonomic nervous system (which includes all of the efferent nerve fibers outside of the cerebrospinal axis excepting those supplying the voluntary muscles) lead to increased and decreased tonus or excitability, and that through this system the activity of the glands of internal secretion are regulated and controlled. According to this theory, therefore, a gastric ulcer may have as its underlying basis an increased vago-tonus, and atropine by depressing this vagus excitability decreases the possibility of gastric irritation. Clinically it has frequently been noted that healing has been effected in obstinate cases of gastric ulcers when patients were systematically treated with atropine or belladonna.

A word might be said concerning the administration of hydrochloric acid, which has been always regarded as an efficient remedy in the treatment of certain forms of gastritis. It is a well-known fact that when taken internally hydrochloric acid has the power to stimulate the secretion of the gastric ferments. This is occasioned by the action of the acid on the pylorus, producing a secretin which when absorbed again stimulates the gastric secretion. It is also well known that when hydrochloric acid is administered it directly stimulates the gastric secretion of hydrochloric acid of the diseased gastric mucous membrane, and also awakens in the gastric mucous membrane the power to produce further acid on the ingestion of food. Hydrochloric acid is best administered after food by giving small doses at 10, 15, 20, and 30 minutes later, thus in a way imitating the natural process of digestion. The proper digestion of food cannot be obtained from hydrochloric acid alone; pepsin must be present at the same time.

Up to a comparatively recent period it was generally held that the administration of pepsin was needless, for it was assumed that the minute quantities needed for proteolysis were present in the stomach. However, it is now known that in order to procure good gastric digestion it is necessary to have both the hydrochloric acid and pepsin thoroughly mixed. This is not thoroughly accomplished when hydrochloric acid is given alone, and pepsin should be administered at the same time; it is also quite useless to prescribe pepsin alone. Hydrochloric acid aids the intestinal digestion, inasmuch as proteids which have been acted on by hydrochloric acid and pepsin are much more easily digested by trypsin; in addition this acid acts upon some precursor in the duodenum producing an intestinal secretin which being absorbed stimulates the flow of the pancreatic secretion.

MECHANICAL SUPPORTS.

I must call attention briefly to the mechanical therapeutics, consisting mainly of the abdominal support in the treatment of enteroptosis. This apparatus is employed in supplying a support to the relaxed abdominal wall and in holding the organs as far as possible in position. The beneficial effect of this apparatus is effected by relieving the symptoms arising from the pressure of the abdominal organs. The supports consist of bandages and corsets. The number of apparatus of this character is almost innumerable, almost every specialist having a bandage or corset furnished to conform with his own views. It is not always a simple matter, however, to supply a well-fitting bandage or corset. In a stout

individual with a pendulous abdomen this is not usually a difficult matter, but in thin individuals there is often great difficulty in adjusting a support which actually holds the organs in proper position.

The need of a support is quickly indicated by means of the Glénard's belt sign. One stands back of the patient, passing one's arms on either side with both hands on the lower abdominal walls. The abdominal flesh can easily be elevated; by suddenly dropping the hands the abdominal mass may be allowed to fall. If the symptoms have been relieved by the support of the hands and return by their removal, there is every indication for the need of an abdominal support or corset.

MINERAL-WATER CURES.

Mineral-water cures have been utilized for many years in the treatment of certain gastric disorders, and yet notwithstanding the fact that these cures are among our oldest methods of treatment, we know but little regarding their actual physiological effect. Our knowledge concerning their action is wholly empirical, and their use must therefore be entirely based on purely clinical evidence. It is well known that the effect of the water is far better when taken at the springs. This may be partly due to the fact that the beneficial effect is augmented by the healthy surroundings, freedom from care, the rest and diet. The fact that many of these waters, as has been recently discovered, are radioactive may also account in a measure for their beneficial effect, and inasmuch as this radioactivity is largely lost in transportation, for their failure in giving relief when taken away from the springs.

INDICATIONS FOR SURGICAL INTERVENTION.

One cannot pass by the question of the treatment of gastric disorders without at least alluding to a few facts regarding the surgical aspect of these conditions.

The newer surgery of the stomach was introduced with Billroth's successful pyloric resection for cancer, and Wölfler's gastroenterostomy in 1881. Since that time there has been a steady advancement in the results of surgery, many so brilliant that operation has often been undertaken as a cure for all forms of indigestion; the results of which have often been dismal failures, increasing rather than relieving the patient's discomfort. At the same time indiscriminate surgery has had a distinctly harmful effect in the advancement of surgery of the stomach. However, when the indications for surgical intervention are present, the results of surgery are most brilliant and gratifying.

The indications for operation on the stomach are as follows:

1. Obstructions, whether at the cardiac or pyloric orifices. Gastrostomy is indicated in impermeable strictures of the cardiac orifice or of the esophagus, and gives great relief until the stricture can be dilated; it prolongs life in cases of carcinoma of this region. Operation is always indicated in obstruction of the pylorus, whether the obstruction be due to simple pyloric stenosis or due to cancer. In cases of benign obstruction, the operations indicated are pyloroplasty, gastroenterostomy, or pylorectomy; in malignant disease pylorectomy is indicated for cure and gastroenterostomy for relief.

2. Gastric ulcer. Simple uncomplicated gastric or duodenal ulcers do not require operation. Operation must only be considered when there are complications or when the ulcer has resisted a thorough medical cure.

The indications for operation are perforation, pyloric obstruction, and ulcers defying thorough medical cures. The surgical procedures which may be undertaken are excision of the ulcer, pylorectomy, pyloroplasty, or gastroenterostomy. The exact procedure to be followed must be determined by the surgeon at the time of the operation.

3. Gastric carcinoma. There is but one cure for cancer of the stomach, and that is operation. This can be accomplished only however when the diagnosis is made early. Inasmuch as early diagnosis is usually most difficult and often impossible, it is wise to urge upon all individuals over forty years of age who manifest symptoms of indiges-

tion which are not relieved by a few weeks of treatment the need of a most critical examination, and if the diagnosis still remains doubtful, of exploratory incision. It is by this method alone that cases of carcinoma of the stomach can be determined early, and at that stage when cure is still possible; otherwise the operation can only be in the nature of relief—gastroenterostomy for relief of obstruction—but not of cure.

I have outlined as far as it is possible in this brief period of time the modern method of treatment of the diseases of the stomach, and I must again emphasize what I attempted to point out at the beginning of this paper, namely, that the treatment is exceedingly simple if the diagnosis be correctly made. It behooves us therefore to study our cases most carefully and critically, so that we may become confident, as far as it is possible, of the correctness of our diagnosis; the treatment follows the diagnosis directly, and can therefore easily be outlined. It is only in this manner that we can secure the very best results.

THE INDICATIONS FOR OPERATION IN GLAUCOMA.

BY WILLIAM CAMPBELL POSEY, M.D.,
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Secondary glaucoma will not be considered in this paper. Indications which follow apply to primary glaucoma only.

Operation should be performed:

1. In all cases of acute and subacute glaucoma and in all chronic cases on the manifestation of any inflammatory glaucomatous symptoms.

2. In all cases of chronic glaucoma in which there is doubt of the patient's cooperation in the persistence in the myotic treatment throughout the remainder of life. This includes practically all hospital cases and such private cases as may be of a weak and vacillating disposition.

3. In all cases of chronic glaucoma which reside at such a distance from proper ophthalmic care that they are unable to report at sufficiently frequent intervals for the supervision necessary in the proper and safe carrying out of the myotic treatment, or for operation in the event that inflammatory symptoms arise.

4. In chronic cases under fifty-five years of age, when the field of vision and central vision are good, an operation upon the most affected eye is advised, myotics being employed in both the operated and unoperated eye for the remainder of life. Operation upon the second eye should follow, if subsequent observation shows that vision is maintained better in the operated than in the non-operated eye.

5. In all cases of chronic glaucoma, without regard to age or the development of the disease, in which myotics have been given a faithful trial for at least six weeks or two months, as evidenced by the constant maintenance of pupilary contraction to almost pin-point size, and in which vision and the field of vision show progressive deterioration.

Cyclo-dialysis is preferred in all cases in which operation is demanded if there be a hemorrhagic tendency or the field of vision is very much reduced. Iridectomy is reserved for all other cases. The trephining operation has been relinquished, as it appears to be a more dangerous procedure than iridectomy, on account of the opacification of the lens which follows in not a few cases, either immediately or remotely after the operation. Furthermore, even in cases in which these complications do not arise, it has not been proven that the visual results after trephining are any better than those obtained by a properly executed iridectomy.

In all cases not included under the five headings given above, myotics should be employed with great zealousness and persistence four times during the day. The maintenance of vision by this method does not warrant the gloomy prognosis which is so often rendered in cases of chronic glaucoma.

SOME PHYSICAL FACTS ABOUT THE RADIOACTIVE ELEMENTS AS APPLIED IN MEDICINE.[1]

BY WILLIAM S. NEWCOMET, M.D.,
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It is the desire in this paper to bring before this body a few of the more common misconceptions that seem to exist regarding these radioactive elements.

There is a general impression throughout the medical profession that radium and the allied elements are bound up in a mystery, that the natural laws governing them are past their comprehension, and that they must be used in a mysterious way to obtain results. Let it be understood that the sooner this mystery is set aside, the better it will be for the medical profession; and, perhaps, those who are exploiting radium by the assurance that they possess the only obtainable supply will be the sufferers.

It is, however, most unfortunate that the supply of radium is so scattered, and some institution could accomplish a bold stroke for mankind if it could centralize or develop an institution where radium and its allied elements could be obtained and employed strictly for what they are worth, divorced entirely from all tendency to exploitation. The expense of maintaining a proper plant would be enormous in proportion to the amount of work accomplished, but so long as radium remains in the hands of private institutions, or worse still, in private hands, just so long will its usefulness be impaired.

The use of these elements medically must be divided into two divisions: (1) For the purpose of radiation; and (2) for employment as medicine internally, depending upon either the radiation or, perhaps, as with other drugs, to some extent the base itself.

First let us consider its local use, where it controls or is supposed to control certain pathologic processes by the radiation of certain rays, the principal one being the most penetrating of all rays, the *x*-ray, analogous to Roentgen rays. A second ray known as the *B*-ray is a ray analogous to the cathode ray, but here again it has a greater power of penetration, and it no doubt plays an active part where these radioactive elements are employed. A third ray, the Alpha-ray, is practically worthless in external applications, although 90 per cent of the energy of these radioactive elements is of this form.

Where these elements are to be used for their radiation the usual form of application is a small flat disk for surface radiation, or small tubes where deeper radiation is desired. The applications are to a certain extent merely a makeshift and are adopted according to the part to be radiated. While fulfilling a purpose, they do not meet the issue to the same extent as in cases in which the separate radium elements are employed and the application molded according to the necessities of the individual case; for instance, if it is desired to insert a given amount of radium into a tumor the strength of 200 or 300 mgs. may be placed in a glass tube which can be slipped into the eye of an ordinary surgical needle of fair size; and, furthermore, if it is lost, the whole neighborhood need not be alarmed. Again, if it is desired to cover a flat surface, a certain dosage, a given size, all that is required is to charge a small piece of metal with the active product, which is left in place for a certain length of time, and the patient can keep it as a souvenir of the occasion. Not until we have some such method established in our midst will it be possible to obtain results that justify confidence.

It must be remembered that radium is merely the parent, that it simply gives forth the elements which give rise to the "active deposit," and while all the therapeutic activity depends upon them, their life is short, and therefore they soon become worthless. In the meantime these elements have again recovered and are ready for further manipulation.

The thorium elements, unfortunately, undergo disintegration in a rather irregular

[1]Read before the College of Physicians of Philadelphia, Nov. 3, 1915.

fashion and, therefore, do not permit the manipulation which is so convenient in this radium group; and while the rays of thorium are still more penetrating than those of radium, its use must be confined to the applicator method; furthermore, its manipulation from a chemical standpoint is difficult.

To thoroughly comprehend the various manipulations possible with either the radium series of elements or those of thorium, it would be necessary to consult and compare the table of these elements showing their average life and the rays emitted by each one; necessarily, rather complicated apparatus is required for their manipulation, and while it is not the province of a physician to carry out the difficult proceedings in the preparation of these different products, we should have established in our midst reliable laboratories where these preparations could be obtained and measurements made as the occasion demanded.

The following instance illustrates, for the sake of protection, the need of such institutions. A few months ago a dealer in this city had two tubes of radium for sale. The reason given seemed sufficient. He stated that they had originally been purchased from a well-known chemical house, the price being $400 to $1400. Tests were made, and it was found that the amount was frightfully small compared with the price asked. He was therefore advised to send them to Washington for collaboration, for if he sold them legal possibilities might develop. A few weeks later the tubes were promptly returned to their owner, and the dealer, who had always been careful of his reputation, was profuse with his thanks for the advice. The value of the radium in the tubes was 40 cents and $30 respectively. Is it any wonder that a plea is made that those using these radioactive products should familiarize themselves to some extent with the physics or leave it alone? Imagine a patient being treated with 40 cents worth of radium! Is this not sufficient reason that a central station should be established to prevent such exploits? Many of you are familiar with several such occurrences in the past, but that these tactics still prevail is past comprehension.

While the external use of radium seems to have many pitfalls the internal employment has many more. Of this, the following is an example. About a year ago a certain physician stated in this building that he possessed a tube of radium which in the daytime he used for the treatment locally, and which at night he placed in a jar of water. He then gave this water to his patients, and from it he claimed to have obtained some brilliant results. Furthermore, he stated that he had measured the activity of the water.

There seems to be a confusion between the so-called rays that emanate from the different radium elements and the emanation, which is an element and a gas—subject to all the laws of all other gases, and consequently when confined within a tube cannot escape. Therefore, the water did not contain emanations. The question still remains: from what did these patients derive their wonderful therapeutic effects?

In the internal administration of radium or thorium certain facts must be taken into consideration, inasmuch as it is the radioactivity and not the elementary base that affects the system, for the quantity is too inconceivably small to be considered from that point of view. Therefore, it would appear that the alpha radiation of these elements might be responsible for any physiologic or therapeutic activity. This being so, in what forms is it possible to bring it into the system; then, in turn, how does it leave the system? Like all other therapeutic agents of this class, this is by far the most important question.

Here again we come to a point needing the most careful study: for example, radium may be given as a salt, which may be either soluble or insoluble; or its product of disintegration may enter the system as a gas in the form of the emanation. These salts give off the emanation in proportion to their age, and continue to give in a definite ratio indefinitely, or as long as they are contained within the system. It must be remembered, however, that insoluble salts allow only

about 2 per cent of the emanation to escape, the rest being occluded within the walls of the powder unable to escape. If a salt of radium is administered, its elimination is by the natural channels, while the emanation formed by it during the time it is in the system is mostly eliminated by the lungs. On the other hand, during the time the radium salt remains within the body the "active deposit" is thrown down, and it being a solid is eliminated as other solids.

Therefore, upon comparing the two methods of administration we have radium, emanation, and active product; while with the second we have emanation and "active deposit." Radium may be obtained in solution; the strength is easily calculated, and the dosage estimated accordingly. Its strength, after it has obtained its equilibrium, is more or less constant. It does not degenerate, at least, for a few hundred years. Being in solution it is absorbed and carried by the blood stream throughout the body. Just what effect the sulphates of the body have upon it is not definitely known. Some claim that it is eliminated promptly; others that it extends over days and weeks; and so on. While in the body it is giving forth its activity, changing slowly into the emanation, the emanation in turn to the "active deposit." Now, should an insoluble salt be administered it passes along the alimentary canal unabsorbed, but it gives off the emanation and "active deposit" which are absorbed. It still holds, however, that the major portion of this emanation remains occluded within the intermolecular spaces of this insoluble powder. Its effects continue until it is eliminated.

But how about the emanation? Here the question is quite different. Although given in solution, water containing emanation must be used at the source with as little agitation as possible; for, like all gases, its solution depends upon all the other natural laws plus those of the rapid disintegration. When it cannot be obtained directly from a spring, the ordinary commercial emanator should be used under the best conditions. It is not a very efficient piece of apparatus, and some of the types placed upon the market are ridiculous. To have a very efficient activator would require one with some skill in its manipulation. Unfortunately, the efficiency depends again upon employing the soluble salts. In the soluble radium salts under the best management about 20 per cent of the emanation will be lost. When you consider that the insoluble salts are usually employed, and that only a 2-per-cent efficiency can be obtained at best, plus the 20-per-cent decrease, it would seem that very little is obtained for the outlay. But the point is, that when the emanation is to be employed, this offers the only practical means of obtaining it.

The emanation taken into the stomach is rapidly absorbed, passes through the system, and in a very short space of time is eliminated by the lungs. Needless to state that its action is transient, and that repeated doses are needed. Sipping moderate quantities of water charged with the gas seems to be the adopted method.

It has been used in baths and inhalations. These methods perhaps might prove useful in the hands of very careful operators, but for general use their efficiency is doubtful. Here attention might be called to the existing conditions in the use of the thorium salts, for if these elements ever become of therapeutic value, these facts will prove most useful. The average life of radium emanation is about 5½ days, while that of thorium emanation is 76 seconds. Now suppose we should take a certain amount of radium emanation into our system. During the time which it remains a certain amount of "active deposit" is formed, but the chances are that most of it will be eliminated as emanation. On the other hand, if thorium emanation is taken into the system, the greater portion passes over into "active deposit," while little of it escapes, the cycle of time being too short. Needless to state that the same principle is employed in the thorium emanators, they in turn being less efficient than the radium emanator, due to the rapid disintegration of these thorium elements.

The desirable product for the internal administration of thorium is thorium X. It has about the same period of life as radium emanation. Therefore, when it is employed

the patient must be close to the source of supply. Since it is a salt instead of a gas, it remains within the system undergoing a very rapid change to emanation and "active deposit," and for this reason the thorium product is more powerful than the analogous radium product.

In these products we have extremely powerful agents which cause profound systemic disturbance. Their value as therapeutic agents has by no means been established. Yet they are being employed throughout the country for the relief of these distressed individuals by persons who have little comprehension of the consequences. There is not the least doubt that they are of value, but like all other materials used in our medical arts, the results are in proportion to the skill employed in their use.

The object of this paper is to draw attention to a few facts frequently confused; and while it is realized that there are many more points to be covered, the few to which allusion has been made emphasize the magnitude of the subject. Fortunately, where these articles have been used, the dosage no doubt has been small, and the baneful effects, if any, have been inconsequential. Likewise, the good that might have been expected failed, for the same reason.

PREVENTION OF TYPHOID FEVER BY VACCINATION.

BY SIDNEY J. MEYERS, M.D., LOUISVILLE, KENTUCKY.

The importance of prophylactic measures in typhoid fever, which for many years has been called "the American disgrace," is emphasized by the fact that annually about twenty-five thousand people in the United States perish from this cause alone. The disease is said to have been more prevalent and fatal in this country than in any other civilized land, which seems a strange commentary upon the presumed prophylactic, sanitary, and hygienic enlightenment of which we have boasted during the last fifty years!

While typhoid fever has probably prevailed more or less extensively from remotest antiquity, not until the etiology was placed upon a definite basis by Eberth's discovery of the causative bacillus (1880) was it understood that the malady might be legitimately classified among the unnecessary and distinctly preventable diseases. Since then some of the most eminent observers in the world have endeavored to devise adequate prophylactic measures which would be generally applicable.

Recognizing that the principal source of the infectious material was water polluted by the dejecta of those suffering from the disease, the earlier prophylactic efforts were for the most part directed (*a*) toward disinfection of all the discharges, followed by purification of the sources of water-supply, (*b*) improvement in hygienic and sanitary surroundings, and (*c*) the sterilization of milk, which it was thought might have become contaminated by the admixture of water. Later investigations, however, demonstrated many other avenues through which infection might be derived—*e.g.*, oysters, clams, fish, and uncooked vegetables were each found responsible for dissemination of the disease at various times.

While the original proposition still remains unchanged—*i.e.*, that in the majority of instances typhoid fever is disseminated through the media of contaminated water and milk—it has been demonstrated that the common fly is also a most prolific purveyor of the infection. It is not difficult to understand how flies may transport infectious material from one place to another, and this applies to other diseases as well as typhoid fever. All foodstuffs exposed to dust and flies may become contaminated, and thus constitute a distinct menace to human life. With the recognition of these multitudinous avenues of possible infection, the inadequacy of former prophylactic methods became apparent and more effective means were diligently sought.

For the first observations upon the prophylactic and therapeutic inoculations in

typhoid fever the profession is indebted to Frankel (1893). Three years later Pfeiffer, Kolle, and Wright advocated antityphoid vaccination or inoculation with living or dead bacilli; and since then extensive experimental and clinical investigations have been prosecuted by competent observers in practically every civilized country.

Antityphoid vaccination was practiced in both civil and military quarters of certain other nations several years prior to 1911, when it was made obligatory in the army of the United States. It is shown by statistics that in the British army in India during a period of five years the typhoid rate was reduced by vaccination from more than fifteen to less than five per thousand; among the French soldiers during an epidemic of typhoid fever, not one who had been vaccinated contracted the disease; in Morocco there was no case of infection among those similarly protected; in the Italian and Japanese armies favorable results were also obtained. In the armies of Japan and France antityphoid vaccination has been made obligatory.

In the Spanish-American war, before vaccination was made compulsory, the death-rate from typhoid fever was enormous. In 1911 there were only two cases in the United States army, with no deaths; in 1913, among ninety thousand American soldiers there were three cases and no deaths. It is reported that in these three infection occurred prior to enlistment, and the disease developed before vaccination could be practiced. Therefore, one may reasonably claim that typhoid fever has been abolished in the United States army by prophylactic vaccination.

"The conclusion is inevitable that the prophylactic vaccine used in the army has given almost absolute protection against typhoid fever, without producing untoward effects of any character, showing definitely that the vaccination is both efficient and harmless" (Russell). Harris adds "that vaccination gives immunity to great masses of those exposed is most eloquently attested to by the vigorous and severe test it has received in our army and navy among more than two hundred thousand men."

In many of the large hospitals and other institutions of this country and abroad antityphoid vaccination has been made compulsory for all employees, including physicians, internes, nurses, etc., with the result that both the morbidity and mortality from the disease have been markedly minimized. In other similar institutions such vaccination remains optional. The results thus far secured have been so favorable in some of the foreign countries that it has been suggested antityphoid vaccination be made compulsory in all schools the same as vaccination against smallpox. While based upon the results obtained among soldiers and in institutions this would seem a most admirable plan, it is extremely doubtful if it could ever be made generally operative for obvious reasons. It should be remembered, however, that children apparently contract typhoid fever with greater ease than adults, one-third of all deaths from this cause occurring in those under twenty years of age. "Young adults and the youthful are most likely to contract this disease, although it may occur at any age. This is the age, then, for the greatest effort to be made to give protective inoculations." It is further suggested that "all nurses and members of hospital staffs; students of colleges and seminaries; employees, and those who are interned in workhouses, jails, prisons, and asylums; men in lumber camps; and all those who travel and are therefore subjected to varying water, milk, and food supplies, such as 'traveling' men, engineers, seamen, tourists, and vacationists, should receive typhoid preventive vaccination" (*Journal of the A. M. A.*, Oct. 31, 1914).

Typhoid fever is always more or less prevalent in Kentucky, although definite epidemics are now less frequently observed than formerly. During the last year or two considerable reduction in incidence of the disease has resulted from prophylactic vaccination.. For instance, prior to July, 1914, about seven thousand antityphoid inoculations had been made under the direction of the State Board of Health, and not a single case developed among those so treated, although many of them were immunized during epidemics. "In the present state of

rural sanitation in Kentucky, the State Board of Health feels that antityphoid inoculation should be especially recommended in every individual between the ages of fifteen and thirty years at intervals of two years." Thousands of immunizing doses of antityphoid vaccine have been distributed in Kentucky, and other States where typhoid has prevailed in the past have been equally aggressive in the campaign of prevention.

It is stated by Bass that since the almost absolute protective value of antityphoid vaccination has been proved, the fact should be promptly accepted by the medical profession, who should encourage its public acceptance by example, but especially by expressions of absolute confidence. "A doctor should no more question the value of antityphoid vaccination than he should question the vaccination against smallpox, or mosquito transmission of yellow fever or malaria" (Bass).

Shimer agrees that vaccination is as successful in preventing typhoid fever as smallpox, and says there are no valid reasons why everybody outside the army and navy should not also be vaccinated; but as vaccination against typhoid fever does not prevent other water and milk-borne diseases, sanitary improvements are as necessary after as before vaccination.

There are no attending dangers if vaccination be properly executed, and the prospect of immunity for at least three years which the method affords would seem to amply justify the procedure. It has been recommended that practically the same plan be followed as in vaccination against smallpox. Four series of immunizing doses of vaccine are given, the first in infancy, the second in childhood, the third in youth, and the fourth in adult life.

Antityphoid vaccine is administered hypodermically under strict aseptic precautions. The site of inoculation, usually at the insertion of the deltoid muscle, should be sterilized by application of tincture of iodine; the vaccine is then injected with a sterile syringe. The inoculation is made in three doses, the first consisting of 500 million dead bacilli; the second of 1000 million bacilli is given after an interval of from a week to ten days; the third of 1000 million after a similar interval. Following each injection the region is painted with collodion and allowed to dry. The vaccine should be merely introduced subcutaneously, not deeply into the muscular tissues. The local and systemic reactions are usually slight if proper technique has been used. The temperature is seldom above 100° F., and subsides to normal within twelve to sixteen hours. The local reaction is greatest following the first injection, less after the second and third. There may be noted slight pain and a moderately inflamed area at the site of puncture, with tenderness of the axillary glands. These manifestations disappear within twenty-four hours.

Quite recently Harris, of New York, has published an extensive review of this entire subject and presents the following conclusions, with which it is believed every experienced observer will heartily and entirely agree:

1. The accurate observations recorded in hundreds of thousands of cases leave no doubt as to the preventive powers of antityphoid vaccination in all but a relatively insignificant few.

2. In those subsequently affected it strikingly decreases the morbidity and the mortality.

3. Severe reactions, if one makes observations from extensive studies (the only correct way), are rare.

4. To avoid severe reactions one must observe carefully several precautions, as follows:

(*a*) Never administer it to any but the healthy.

(*b*) To permit of slow absorption, avoid puncture of a vein, or intramuscular injection.

(*c*) Clean syringe and sterilize the area for injection, using tincture of iodine for the latter purpose.

(*d*) Children especially are to avoid exposure to the sun following treatment.

(*e*) Avoid administering it during the menses or pregnancy.

(*f*) Allow no hard work or indulgence in alcohol after the injection.

(*g*) Avoid reinjecting in indurated areas.

5. Severe reactions have never left permanent injury.

6. When the incubation period has begun, the time for antityphoid immunization has passed. The treatment is a preventive of typhoid fever, and not a typhoid antitoxin.

7. Long exposure to overwhelming doses of typhoid bacilli (in those who are in close contact with cases and especially in epidemics) may nullify the immunizing powers of antityphoid vaccine, and an attack may therefore follow one or more injections.

8. Chronic illness (tuberculosis, etc.), as well as debility from other causes, and fatigue and exhaustion as well, predispose to severe reactions.

9. Injections after intimate and long exposure hasten the onset.

10. For a period of at least two years, and possibly more, immunization is as effective in protecting from an attack of typhoid fever as is a previous attack of the disease itself.

11. Recurrences may follow after a complete immunizing course of treatment, in exceptional instances in which debility and fatigue exhaust the resistant and defensive powers of the body, and when exposure to massive doses of typhoid bacilli exists.

Russell has suggested that all persons whose profession or duty involves contact with the sick should be immunized. "The general vaccination of an entire community is feasible and could be done without interfering with general sanitary improvements, and should be urged wherever the typhoid rate is high" (Russell).

THE TREATMENT OF ACUTE OTITIS MEDIA.

In the *Virginia Medical Semi-Monthly* of September 24, 1915, WILKINSON states that in the first stage he gives his patients something for relief of pain. He gives hot drops of glycerin, atropine, and a sedative containing either tincture of opium or morphine. These should be instilled into the ear hot. If they are not hot, very little will be accomplished by their use.

Local applications of heat of some kind are always graciously received and are to be commended. A hot salt solution or hot-water bag or a hot iron are convenient means of applying local heat, and they often bring relief. Wilkinson wants to warn against a pernicious habit which is too commonly practiced—that is, of leaving the ear exposed after it has been subjected to some form of heat. He invariably ties up an ear after it has been aching, and keeps it tied up during the following night. He is certain that many ears are permitted to go on to suppuration from the neglect of this simple precaution. He has heated an ear and caused a local perspiration, and then exposed it to the atmosphere, and the ear aches again. In other words, we rest on our arms and permit the enemy to reload and come at us again.

Since a patient with acute otitis is usually suffering with a cold, means should at once be instituted for its relief. A calomel purge is indicated, followed with a saline or the good old remedy, castor oil, and, aside from a personal dislike to the taste, Wilkinson feels that it has, especially in children, a somewhat specific action in congestions of the nose and nasopharynx. He puts his cases to bed with instructions for them to stay there till next day. The surest way of preventing the otitis from going on to suppuration is to keep the patient on light diet, with a liberal supply of water, and in bed for at least twenty-four hours.

In all cases, except very small children, sedatives are indicated where the pain is severe enough to justify them. Of these, Wilkinson usually prefers aspirin and small doses of phenacetine with a little caffeine to prevent depression. They add to the comfort of the patient as well as tend to abate the attack. [Some believe aspirin is contraindicated.—ED.] The other treatment in these cases in no wise differs from that of the treatment in the second and third classifications which he will mention later. In some cases an opiate may become necessary, but as a rule it is contraindicated, as it masks the symptoms; besides, any case which is not relieved with the above reme-

dies has advanced to suppuration and the drum should be incised.

Treatment of the suppurative or exudative stage will depend entirely on the condition found. If the drum is not yet bulging and the pain not severe, he is inclined to follow out the treatment as given for the incipient cases above—*i.e.*, hot drops, hot local applications, depletion with mercury, and put to bed with ear tied up and wait twenty-four hours. Wilkinson is not one of those who believe that every red drum should be incised. He admits that in some cases the drum will break within twenty-four hours after the onset, but this is the exception. The pain and temperature will naturally aid in determining the severity of the case. If there is a bulging drum, there is no use in waiting. Make a rather liberal incision through the posterior portion of the drum; do not merely do a paracentesis, but make a large opening. A paracentesis is often worse than nothing, and the word ought not to be known in aural surgery.

If the drum is cautiously painted once or twice with equal parts of menthol, carbolic acid, and cocaine, it can be incised with but very little pain. Wilkinson thinks the electric light in the speculum enables the unaccustomed practitioner to see better than the average head light. A middle-ear cavity that is filled with secretions is sufficiently deep to permit of incising the drum without incising the mucous membrane of the inner wall of the cavity, which is exceedingly sensitive and is not anesthetized by local application on the drum membrane. He is sure this is often the cause of much pain in opening the drum. In small children and some nervous subjects a general anesthetic is often necessary, nitrous oxide gas being the one he usually uses. Some surgeons claim that to incise the mucous membrane is of benefit, but he fails to see its virtue, since drainage is the chief object in view. After the drum is incised, hot antiseptic drops are indicated. These may be composed of equal parts of carbolic acid, tincture of iodine, and glycerin, or of boracic acid 15 grains, alcohol 1 drachm, rose water q. s. 1 ounce. If a sedative is still needed morphine or tincture of opium can be added. The ear should be still protected from the cold by a bandage.

Earache after the drum has been incised or after it has perforated shows one of two things: there is poor drainage or there is a rather severe infection. If the hole in the drum is too small, as seen after the canal has been irrigated with some hot solution (boracic acid is a good one), the opening should be made larger after anesthesia has been secured, as already indicated. We will save time, give comfort to our patient, and hasten his recovery by enlarging the opening. As a rule, it is best to make two incisions in these cases, making the first cut down from the perforation and the second one backward, thus permitting the wound to gap and give drainage.

If the pain is due to severe infection, the general condition of the patient deserves attention. Laxatives should be ordered, and the patient should be put to bed and kept there as long as he has fever. The ear should be irrigated with antiseptic non-irritating solution. Boracic acid solution, weak carbolic acid, or weak bichloride solution is efficient. Wilkinson doubts the wisdom of using dioxygen in these cases. He has always felt that there was some possibility of extending the infection into the antrum by means of its use. The ear should be irrigated as often as every two hours in cases in which the discharge is free and acrid—*i.e.*, when it causes the external canal to become sore. As the discharge decreases, longer intervals should be allowed between the syringing. In this class of cases Wilkinson has found hot drops of atropine, morphine, and chloral of benefit. He often uses the following prescription:

> Morphinæ sulph., grs. ij;
> Atropinæ sulph., grs. iij;
> Chloral. hydratis, grs. v;
> Glycerini, q. s. f℥ss.
>
> Sig.: Use five drops in ear hot every half-hour until relieved.

Many aurists prefer the carbolic acid and glycerin drops, using from 1- to 5-per-cent solution, but Wilkinson is prejudiced against these drops after the drum is opened, as he believes they have a tendency to cause the opening to close too soon.

EDITORIAL.

ASSOCIATED PULMONARY AND CARDIAC DISEASE.

The general practitioner is prone, because of the pressure under which he works, to be content with a diagnosis, or recognition, of a single condition which is sufficient to account for the chief symptoms from which the patient is suffering. For this reason the fact is often overlooked that because a man has one disease this is no reason why he should not have in association with it one or two other diseases. Not infrequently the second or third malady, numerically speaking, becomes, or, perhaps, is from the first, the dominant one, but the physician naturally pays attention to the first condition which he has recognized, and possibly wonders why the patient does not respond to treatment.

An interesting statement of this general proposition as it applies to thoracic lesions, secondary to heart disease, was published by Brooks in the *Journal of the Medical Society of the State of New Jersey* for June, 1915. While it has been recognized for many years that changes in the lungs or pleura often complicate cardiac lesions, nevertheless the reiteration of this fact is timely, and Brooks has done well to call attention to it once more. For some of the pulmonary conditions, which are secondary to cardiac lesions, there is little that can be done by direct treatment, as, for example, a case of pulmonary infarction. In most of the other states which are induced the skilful physician may give a patient so much relief that he is not only relieved of great suffering and distress, but the condition of the heart is improved, not only by direct treatment, but also indirectly in that nervous stress and strain, coupled with mental anxiety, are removed and the labor of the heart materially decreased. A patient who is sufficiently ill, when suffering from cardiac lesions, to be confined to bed, may develop with more or less suddenness a considerable degree of hypostatic congestion at the base of the lungs, and unless this part of the lungs is examined daily the physician will overlook this state, the more so if he is content with merely ausculting the anterior portion of the chest at the time of listening to the heart sounds to discover if they have undergone any notable change. This hypostatic congestion can be benefited and often avoided if the posture of the patient is changed from time to time so that he does not remain continually in the dorsal decubitus. He can also sometimes be benefited by the application of dry cups and active stimulation of the heart through the employment of a few doses of some rapidly acting stimulant, like aromatic spirit of ammonia, or by the use of a few large doses of digitalis, whereby the right heart is enabled to drive the blood through the lungs with greater vigor.

In other instances the development of marked orthopnea causes the physician to suppose that the heart is broken down much more seriously than he had supposed, and this leads to more active medication directed to the heart, when a careful examination of the chest would have shown that the shortness of breath was induced by the presence of a more or less profuse hydrothorax. It will be recalled that this form of hydrothorax is most commonly found upon the right side; the explanation of this fact being, as has been so well pointed out by Fetterolf and Landis, by the pressure of a dilated right auricle upon the pulmonary veins, with the result that transudation takes place from the visceral layer of the pleura.

In those cases in which there is considerable cyanosis, jugular distention, and manifestations of general venous stasis occurring as an acute manifestation or developing slowly, there can be little doubt that the practice of venesection, associated with free cardiac stimulation and the relief of hepatic congestion by free purgation, very often gives great relief.

Although hypostatic congestion may threaten life if measures are not promptly taken to combat and overcome it, it is to be

considered, as a rule, a manifestation of gradually developed circulatory feebleness, whereas, on the other hand, the occurrence of so-called pulmonary edema is usually met with in cases of hypertension, and occurs as a sudden complication in patients who have for months or years suffered from high arterial pressure, which, combined with the progress of pathological changes in the heart muscle and in the blood-vessels, finally results in profuse transudation into the pulmonary tissues. Strictly speaking the pulmonary edema, although in reality due to high blood-pressure, is often associated at the time of its occurrence with a sudden drop in pressure which possibly is responsible for its occurrence. In our experience pulmonary edema is best relieved by the very free administration of atropine hypodermically, this drug being injected into some part of the body in which we have reason to believe it will be rapidly absorbed. Our opinion is in accord with that of Brooks that venesection is not suitable to these cases, although active purgation sometimes seems to do good. If there is much mental distress the association of a quarter of a grain of morphine with 1/100 of atropine is often most advantages. Brooks thinks that deep intramuscular injections of pituitrin or adrenalin, using from 10 to 20 drops of the usual 1-to-1000 solution, associated with absolute rest, is possibly the best treatment.

Chronic cardiac disease lasting over many years in association with chronic bronchitis often seems to be responsible for bronchiectasis, and in such cases the combined use of digitalis and stimulating expectorants is wise.

It not infrequently occurs that a patient presents himself suffering from chronic cough and expectoration, with the result that a diagnosis of bronchitis is made. Expectorants are given with little or no benefit, when, if the heart had been examined, the physician would have recognized the fact that digitalis or strophanthus would clear up the bronchitis by improving the circulation of the lung, which because of its impairment has diminished the vitality of the tissues so that the bronchial mucous membrane became unusually susceptible to infection. It sometimes happens that the absence of a murmur leads the careless physician to the conclusion that there is nothing wrong with the heart, when in reality this absence should make him consider whether the heart muscle was not so feeble that it is unable to produce a murmur. So, too, in myocardial degeneration, with or without associated valvular disease, the feeble or distant first sound may indicate to the educated ear that the heart needs more attention than the condition of the lungs.

STIMULANT DIURETICS IN ACUTE NEPHRITIS.

We believe that it is generally considered by clinicians that substances which are stimulating in their action are prone to be somewhat irritating, and that for this reason stimulants are often contraindicated when disturbance of function arises as the result of acute or subacute inflammatory processes. There is, however, little experimental, or so-called scientific, evidence to support this view, it being arrived at by a process of reasoning rather than by direct experimental work. Such experimental results are, however, beginning to be presented to us, although it is very evident that when acute or subacute nephritis is induced in the kidneys of animals by the use of irritant substances like cantharides, uranium, or other irritants, the condition is not identical with subacute or chronic nephritis, which are forms of renal disease most commonly met with in practice.

In the *Archives of Internal Medicine* of June 15, 1915, O'Hare reported an investigation as to the influence of theobromine sodium salicylate (diuretin) in acute chromate nephritis induced in rabbits. It is interesting to note that in the tubular nephritis caused by potassium bichromate the administration of theobromine sodium salicylate, which is designed to increase the urinary flow, rendered scanty by the inflammatory process, was found to shorten the

life of the animal, although in mild cases it seemed sometimes to prolong it. More important, O'Hare concluded that, on the whole, this drug seems to increase the lesion in the kidney and to hinder excretion of water, phenolsulphonephthalein, and possibly nitrogen. While this research does not conclusively prove the point, it certainly indicates what we have always taught, namely, that in the presence of acute or subacute inflammatory conditions in the kidney, indicated chiefly, from the clinical standpoint, by the presence of red blood cells in the urine, the administration of stimulant diuretics is unwise.

A NOTE ON MERCURIAL POISONING.

Poisoning by bichloride of mercury is so common that any contribution on the treatment of this condition, or to our knowledge of the lesions which are produced by the ingestion of this virulent poison, is of interest and importance. For this reason we think it worth while to call the attention of our readers to a paper by Kahn, Andrews and Anderson, which appeared in the *Medical Record* of August 28, 1915, in which they report a case of an adult who swallowed between 25 and 50 grammes of bichloride of mercury with suicidal intent. He speedily went into a condition of shock and developed coma, and ultimately died, but although the case had this unfortunate ending, it was found that washing out the large bowel with gallons of saline solution prevented the development of severe colitis which is so commonly met with in this form of acute poisoning. These investigators saved the fluid so used, and found upon careful chemical analysis of almost every tissue of the body that the largest amount of mercury was obtainable from the irrigation fluid, which would seem to indicate that colonic washing is to be employed in all cases. The liver, as is the case in so many forms of metallic poisoning, was the organ which contained the largest quantity of the drug. Thus this organ was found to contain no less than 19.3 milligrammes in 100 grammes of tissue analyzed, or 303.01 milligrammes in the entire organ. The kidneys were the organs which contained the next largest quantity of the drug, 13.7 milligrammes in 100 grammes of tissue, or 39.74 milligrammes in the entire organs. The spleen contained 8.4 milligrammes in 100 grammes of tissue, or 23.1 milligrammes in the whole organ. It is interesting to note that the thyroid contained 5.3 milligrammes in 100 grammes of tissue. The total amount of mercury chloride recovered from the first washing of the large bowel was 2725.5 milligrammes, and from the second washing 82.7 milligrammes.

Of course, the administration of egg-albumen is still to be regarded as the best antidote by the mouth, but, aside from the medicolegal importance of this research, the colonic irrigation would seem to be a matter for the practitioner to bear in mind should he be called to treat this form of poisoning.

THE VALUE OF THE LACTIC ACID BACILLUS.

It is one of the ironies of fate that the reputation of Metchnikoff rests, in the minds of many of the medical profession, and certainly amongst the laity, upon his suggestion that the lactic acid bacillus, by preventing the growth of putrefactive organisms in the alimentary canal, exercises an advantageous therapeutic effect. When the suggestion first appeared some enthusiasts went so far as to claim that the degenerative changes, which are coincident with advanced years, are dependent upon the absorption of poisons made by putrefactive organisms, and that the constant ingestion of lactic acid bacilli would prolong youth and increase the span of life. It goes without saying that such views are erroneous, and that while the lactic acid bacillus is of considerable value in a limited class of cases, it is by no means a cure-all and, like all remedial agents capable of doing good, is capable of doing harm if administered when its effects are capable of increasing rather than dimin-

ishing the difficulties under which the patient labors. Briefly stated, it may be said that when putrefactive organisms are breaking down protein substances a pure culture of the lactic acid bacillus may be administered in many instances with advantage. Whereas, on the other hand, if the digestive disturbance is due to the fermentation of starches or sugars it will make matters worse, increasing the fermentation and the acidity.

It is interesting in this connection to remember that Herter and Kendall as long ago as 1908 showed that it was possible, by feeding monkeys for two weeks on nothing else but milk containing the bacillus bulgaricus, to induce or maintain the acid reaction from one end of the alimentary canal to the other, but they also found that its efficiency was chiefly above the ileocecal valve, which, of course, is not the area in which a large amount of absorption of putrefactive production takes place. The important part of the alimentary canal in such a process is therefore comparatively little influenced.

More recently Raehe has gone much further and shown that this bacillus does not grow readily in the colon, although it seems to be able to survive over a considerable period of time in the small intestine, multiplying there and adjusting itself to the conditions which exist.

It is unfortunate, but nevertheless true, that remedial agents are found sooner or later to possess distinct limitations of value. It is perhaps even more unfortunate that they are, when first brought forward, received with so much enthusiasm that erroneous conceptions of their actual value are widely disseminated, and being widely disseminated are correspondingly persistent, with the result that they are used carelessly, or distinctly abused, and, what is worse, the patient for whom they are prescribed may be also abused. The moral is that the physician must have a clear idea of what he ought to do and a definite understanding as to what his remedies can do.

INTESTINAL DRAINAGE AND SEPTIC PERITONITIS.

At this present day when the recognition of the enormous protective power exerted by an untraumatized peritoneum seems well-nigh universal, and when the surgeon contents himself in critical cases with the least possible handling, the notes of a series of cases reported by Nyulasy (*Lancet*, Oct. 9, 1915) are illuminating. The first one recorded is that of a woman eighty years old, on whom he practiced curettage, excision of a cyst of the right ovary, and looping of the left ovarian ligament, hysteropexy, and appendicectomy for subacute appendicitis. The following day the patient suffered pain, and the second day she was what the reporter calls "collapsed," with a temperature of 97° F. and a pulse of 140, but refused operation until a week later, when it was noted that her condition had become very grave, with a fluctuating temperature, with a pulse of 120 to 140, blood, feces, and flatus passing. Nine days after her first operation because of her continued illness a rubber tube was purse-strung into her cecum. A week later an enema came out through this cecal tube and also out of the lower end of the suprapubic incision. Both openings closed in a few weeks. The reporter states the appendix was removed by an assistant, and attributes the ill consequences that followed to a lack of skill on the part of this unnamed youth. To the reader this case is valuable, since it increases his already high respect for the resistant powers of the peritoneum.

The second case was curetted, salpingectomized, and oöphorectomized, also hysteropexed. There was no mention of any postoperative symptoms, but a casual incision was made a few days later over the cecum and pus was found to well up from the locality of the uterus, the infection supposedly coming from what was described as a small, hard lump at the end of the uterine ligament found at the time of the original operation to contain about half a drachm of yellowish pus. Somewhat later the patient became bloated, with a pulse of

140. The surgeon, fearing that the intestine might possibly burst, performed an enterostomy through the upper end of a suprapubic incision, which reached to the umbilicus. The most convenient loop was brought up, stitched to the subcutaneous fat, and a tube inserted. As a final touch the author states that "the blood-stained fluid in the abdomen was only roughly mopped up." This patient was discharged in about six weeks with all wounds healed. A further tribute to the powers of the peritoneum when sick and insulted!

A third patient, twenty-two years old, entered the hospital with a three-months criminal abortion and had her uterus promptly cleaned out. It is observed that she "deteriorated, looked pale and distressed, had a drying tongue, and a pulse of 135." On opening the abdomen blood-stained fluid filled the pelvis. After breaking down adhesions a right tubo-ovarian abscess containing foul pus was found. The patient continued to deteriorate, the face still being pale and drawn. It is true the bowels were acting with purges and enema. There was only slight vomiting and the patient became bloated. Cecostomy was performed, at the same time turbid fluid being mopped out from the pelvis. Douglas's pouch was also opened through the vagina and gave exit to thin, stinking pus. It is noted that this patient did well.

The fourth case had densely and extensively adherent pus sacs excised, it being noted that the stump of the left broad ligament was so friable that ligatures cut through it as though it were cheese. The inflamed appendix was also removed. Again this patient progressively deteriorated, and in forty-eight hours after operation was in a very grave state. As in the former cases she looked drawn and anxious. The pulse-rate was 140, temperature 97°, and she became bloated. On opening the abdomen over the cecum a good deal of watery, blood-stained fluid appeared, and was fairly well mopped out. A rubber drainage-tube was fixed in the cecum. The original wound was then opened, and more fluid was mopped out of the pelvis and a rubber tube inserted. Two and a half days after these procedures it is noted that the patient was reading the newspaper.

The next case of double salpingectomy was so profoundly shocked by the operation that she could not be placed in the Fowler position until the next day. As in the former cases she deteriorated. It is somewhat keenly observed that a great change for the worse took place. Not only was the face pale and the lips livid, but the nose was pinched and the pulse-rate 144. Again the pelvic cavity of this patient was mopped, and a rubber tube was fixed in the cecum. A pean of victory can be detected in what might be called the commonplace observation of the author that "on the fifth day she was taking fish."

And, finally, there is a case of ectopic gestation ruptured three weeks before observation, her pallor having that "dirty" appearance suggesting sepsis. At the time of operation, after opening the abdomen, removing the fetus and a well-developed placenta, double salpingectomy was done. The reporter ingenuously states that "in spite of many swabs and much saline, it was found impossible to cleanse the abdomen of clots." Two days later he notes that fecal vomiting had set in and that 20 ounces of fluid had been brought up at one bout, which was strikingly fecal in odor and in every way suggested the bowel contents. Vomiting thence onward was continuous and profuse, 18 ounces being brought up about noon. The pulse at the time of the second operation was 160 and the temperature 96.4°. There was great bloating, and this patient looked intensely pale and ill. At the time of the second operation there is an honest admission that no attempt was made thoroughly to get at the fluid in the abdomen, only the accessible surplus being mopped away. The cecum was tubed, and in twenty hours the patient was taking milk and manifesting an interest in her dietary. Barring a right basic pneumonia the progress to convalescence was uneventful.

These case reports are of interest, not because they recall the therapeusis of

another day, nor solely because they show the enormous resisting power of the peritoneum, but rather because they seem to indicate that cecostomy has its uses, and that even in patients hopelessly traumatized and infected when the Fowler position and the Murphy drip are unable to exert their life-saving functions, providing an intestinal paresis be not wide-spread and complete, cecal drainage may be a valuable procedure.

THE TREATMENT OF EMPYEMA.

The treatment of empyema is a subject always of vivid interest to the medical profession, because cases of this affection are so frequent as to come under the attention of all practitioners. The term as used implies pus in the pleural space and pus due to the usual pyogenic organisms; the pneumococcus being the one most commonly encountered, the streptococcus, the colon bacillus, the gas bacillus, and others being less frequent. In the present war the gas bacillus has been, as in the case with wounds in other parts of the body, the dominant factor in fatalities. In practice empyema is nearly always secondary to bronchopneumonia. Incidentally it follows perinephritic abscess, subdiaphragmatic abscess, acute osteomyelitis in the vertebra or ribs. It is chiefly with the empyema following pneumonia that the general practitioner is concerned, and in large measure the success in the operative procedures is dependent upon his early recognition of the presence of pus in the pleura. The low mortality of the present day is in the main incident to this earlier diagnosis and the prompter treatment, since it must be confessed that the methods of dealing with the condition are not materially better than they were twenty years ago. The diagnosis should be framed in the first place upon the continuance of septic symptoms, or even their aggravation beyond that period when pneumonia should go.

A wise practitioner has enunciated the doctrine that there is no such thing as an unresolved pneumonia, and that the symptoms so often attributed to this condition are in reality due to a lung abscess, which is rare, or to an empyema, which is common. It may well be that lung abscess is not as rare as supposed, since in autopsied cases of pneumonia some 20 per cent are found to exhibit abscess. It is clinically true, however, that if these abscesses be common they undergo spontaneous drainage and resolution as a rule, and that a collection of pus in the lung amenable to surgical treatment is a rarity. To the surgeon at least the diagnostic signs are in the main dulness or flatness on percussion, displacement of the heart, and absent fremitus, further corroborated by an aspiration done with an exploring needle. The problem presented to him is to get rid of the pus and have the lung take its place, apparently not a difficult one of solution, since the cavity is readily accessible either between the ribs or after resection of one or more of these, when an aperture of practically any size may be made and maintained.

The practical difficulty lies not in the introduction of the drain, but in keeping it effectual. The usual history of these cases is the prompt subsidence of septic symptoms lasting from one to three or five days following drainage; thereafter a recrudescence of fever with diminution or entire stoppage of the discharge from the suppurating cavity. This may be due to one of two causes. The usual cause is the blocking of the drainage tube by thick masses of fibrin characteristic of a pneumococcic infection. The other is due to adhesions forming about the drainage-tube and guarding the communication between its end and one or more pus cavities. This blockage may be avoided in part by making an adequate opening in the first place, except in patients profoundly ill, a loosening and clearing out of the fibrinous deposits, at the same time making one, two, or three openings through the chest wall and placing drainage tubes of adequate size in each. In large accumulations with patients critically ill the preliminary drainage is best accomplished by thorough local anesthesia between the ribs and down to the pleura, skin incision,

the introduction into the pus sac of a round-pointed trocar and cannula, the passage through the cannula on withdrawal of the trocar of a tube which easily fits it, the withdrawal of the cannula, the securing of the tube in place by a stitch, and the connecting of the tube to a Wolff bottle placed on the floor by the patient's bedside, thus giving a negative pressure and forcing the lung to take the place of the pus as it flows out. Such drainage remains air-tight for at least twenty-four hours, and practically so for several days, but unless the infection be streptococcic and the pus be thin, it shortly becomes inadequate because of blockage, and even in the streptococcic cases may become so, due to blocking off by adhesions. The patient, however, will be in good shape to stand a wider opening with a few days of lessened sepsis and pressure. The wide opening and the rib resection can be made entirely painless by local anesthesia, which should usually be employed.

Against collapse of the lung positive pressure in the form of tracheal insufflation of ether has sometimes been advised. For empyema it is difficult to imagine circumstances for which it would be indicated. At the time of opening collapse of the lung may be expected. In unilateral cases this is not of serious moment. The lung inflates fully with each coughing effort, since the glottis is thus closed and the air from the sound side is driven over into the affected lung. On the proper application of a valve made of rubber dam the resultant pneumothorax rapidly becomes less. This rubber-dam valve is so framed that air can escape much more readily than it can enter. It is most easily arranged by strapping a piece of rubber dam in such wise that it drops across the end of a rubber tube leading from the chest and cut flush with the surface. Expiration blows it away; inspiration sucks it into the opening and also close to the wound. Cotton remarks that the cases of empyema which have gotten well in the past have often done so simply because the pus poultice with which they were dressed became in itself a valve. It is undoubtedly true that the present mortality of empyema has been lowered, and the number of cases relapsing into the chronic form are less than was the case twenty years ago. The credit for this can be laid to the doors of the doctors rather than the surgeons, since the better results are due to earlier diagnosis and earlier efficient treatment.

THE DURATION OF TREATMENT IN FIFTEEN HUNDRED CASES OF MILITARY SURGERY.

Under this title RAE (*Lancet*, Oct. 2, 1915), in the interest of enabling the surgeon and the physician to forecast how long a period must elapse before a patient will regain the condition of health which was his prior to illness, has undertaken an investigation based on the practice of the Connaught Hospital, to which are attached thirteen auxiliary hospitals where the patients are transferred as soon as it is safe to do so after their admission. In these hospitals treatment is pursued until such a time as it is considered no longer necessary, when the patients are returned to the Connaught Hospital for disposal. Cases used for study did not include any who died after they were returned to the Connaught Hospital, any who were discharged as medically unfit for military service, or any about whose diagnosis there was doubt; the sole object of the investigation being to establish the period of convalescence. In expressing the results the term "convalescent days" is applied to the stay in the auxiliary hospital. Rae states that these figures cannot be applied to ordinary civilian practice since they refer to males only and males of a picked class, and furthermore that these males are under the care of the medical and surgical staff, which varies far more markedly than that of the civilian general hospital. In a large number of cases synovitis and displaced semilunar cartilage and sprain are reported. Among the medical cases acute respiratory diseases supply nearly one-half the total, and bronchitis and rheumatism account for almost one-third. The average duration of "convalescence" in a surgical case was over

twenty-eight days, and in a medical case over twenty-five days. The total cost of these "convalescent days" to all the auxiliary hospitals was over $30,000, for which sum a battalion and a half were restored to health. In looking over the list of diseases it is gratifying to note that there is not a single instance of gonorrhea or syphilis.

Taking up surgical conditions in detail the civilian surgeon will be surprised that displaced semilunar cartilage required 538 days with 10 cases; of the 55 hernias the average number of days under treatment for each was over 44; thirty-four days for hemorrhoids; 50 days for varicocele; 42 days for varicose veins; and 39 days for cryptorchidism, of which there was one case. Forty-one days were required for fistula in ano, 110 days for fractured patella, and 205 days for fractured femur.

Just what is meant by the term rheumatism is difficult to determine. Large numbers were thus afflicted, both in the expeditionary force and in those under training. The rheumatic case was under treatment on an average about 45 days.

Because of the entire lack of detail with which the report is published it is impossible to determine whether the period needful to return these men to duty be comparatively long or short. It does seem, however, that a case of hydrocele should not have been kept 51 days under treatment; that an average of 49 days is somewhat long for urethral stricture; and that an average of 50 days incapacity is much more than is commonly allowed in a syphilitic orchitis. As opposed to this, the surgeon who can turn back to duty fractures of the tibia and fibula, of which there were 12, in 55 days; of the astragalus, of which there was one, in 40 days; of tumors, of which there were five, in 43 days; or of the radius and ulna, of which there was one, in 31 days, is doing well, forming in fact a marked contrast to him who takes an average of 27 days to cure lipomas, of which there were three.

Such a report is deserving of high praise because of the toil needful for its compilation and because it was actuated by a kindly and uplifting spirit.

REPORTS ON THERAPEUTIC PROGRESS.

THE TREATMENT OF HEART DISEASE.

F. C. SHATTUCK in the *Boston Medical and Surgical Journal* of August 26, 1915, writes that watery catharsis does not weaken the dropsical heart patient, and it may be well to explain this to him. He is inclined to think we are not always bold enough in our use of hydragogues. Serous effusions, if marked or obstinate, are to be tapped. Drainage of the legs by Southey's tubes or a modification thereof may be a help. In cases of markedly overdistended right ventricle, and in these cases cyanosis is usually pronounced, venesection up to a pint or more may be the first procedure indicated. The effect is sometimes almost miraculous. A dozen leeches, followed by poulticing their bites, may have a similar effect in relieving the right heart and be a substitute for venesection, if this is for any reason thought to be undesirable. One of the upper quadrants of the abdomen is a convenient place for leeching. Bleeding may pave the way for direct cardiac treatment, digitalis, which is of no use before relief of the right ventricle, manifesting its power thereafter.

In all cases of heart dropsy Shattuck watches closely the amount of urine and is apt to try to increase it. The dropsy is not only a measure of cardiac efficiency, but also a hindrance thereto.

The diuretic action of calomel seems to be due, at least in part, to its effect on the renal cells. Shattuck avoids its use for this purpose if he believes the kidneys to be subject to more than passive congestion. He has seen a single dose of calomel salivate a nephritic. As a cardiac diuretic he has been

in the habit of giving three grains of calomel every four hours, enjoining special care of the teeth. Given thus, it does not seem to affect the bowels. If it acts on the kidneys at all it usually does so on the second or third day, though he has seen the effect first appear on the fifth.

The diuretic action of caffeine, and its first cousins, diuretin and theocin, is thought to be largely of vascular origin, though a direct action on the heart itself cannot, Shattuck thinks, be as yet absolutely denied. Diuretin, in his experience, has never been of avail in renal dropsies. In those of cardiac origin its effects may be temporarily very gratifying. He has been led to attach value to its action or failure to act in cases of cardiorenal dropsy as an aid in deciding whether the cardiac or the renal element is predominant at a given time.

The objection to the alkaline diuretics is that their use runs counter to the dry diet which is ordinarily desirable when the blood mass is too great. Fluids are to be limited, as far as is compatible with the comfort of the patient, and the resourceful physician will secure tolerance and a greater fluid restriction than the routinist. Otherwise, diet should be nutritious, easily digested, moderate in quality. Gastric flatulence is to be avoided or counteracted.

There are cases, and times in the course of cases, in which Shattuck believes wine or spirits, wisely used, to be of real service. Alcohol, unlike the rapid cardiac stimulants, such as camphor, aromatic ammonia, and ether, has some food value—calories, in modern parlance.

Direct stimulation of the myocardium is ordinarily desirable or necessary in conjunction with efforts to reduce the load. The members of the digitalis group are diuretics only in so far as they act on the myocardium, increasing its power, and thus raising the blood-pressure. It is to this group that we look for direct and lasting myocardial stimulation. At its head stands, of course, digitalis, the many preparations of which and the dosage, varying in size and frequency, Shattuck passes over, simply noting the advance in recent years in standardizing digitalis. The only other members of the group worth mentioning here are strophanthin and apocynum. He knows no digitalis preparation which can produce such a rapid effect as strophanthin and cymarin when given intravenously, and perhaps, also, intramuscularly. The latter drug he has never used.

As a rule it seems to him better to give only one of the members of the caffeine or digitalis groups at a time, pushing the dose until either the desired effect is produced or there is evidence that the system is under its influence. This he thinks a great therapeutic law, applicable broadly to all active drugs. Exceptionally, however, judicious combinations seem to work better than the single remedy. He emphasizes the fact that we can only guess as to whether myocardial change is of such nature and extent as to be possible of repair or compensatory adjustment. Therapeutically, therefore, is it not wise to assume that some measure of such power is present, and try to call it forth? Is there one of us who has not found himself mistaken in both directions? In the long run, it is better to err on the hopeful side.

The second major mark of cardiac failure is pain—angina.

This, as contrasted with edema, is suggestive of degenerative change, usually of the left ventricle, perhaps very local, and is the result of impeded coronary flow, to which spasm is superadded. Physical signs may be absolutely lacking, and diagnosis rest practically on a single symptom. Shattuck is inclined to think that angina is not recognized as often as it should be, some thinking that the pain cannot be of the nature unless agonizing. The pain is of all grades.

Although arteriosclerosis is common enough in hospital wards, we rarely there, or even in the out-patient department, see angina. The spasmodic element seems to be enhanced by a higher development of the nervous system than is common in hand workers. The treatment of anginal conditions falls into two natural divisions—that of the attack, mainly palliative, and that of the prevention of other attacks. A

patient subject to angina should never be without a nitrite ready for immediate use. Shattuck generally advises glonoin tablets as being, on the whole, more convenient. But amyl nitrite sometimes works better. It may be well to give a small dose before a necessary exertion, especially if this soon follows a meal, as a prophylactic against pain.

But the all-important therapy of angina, whether grave or relatively benign, is the regulation of the mode of life. The innocent and the grave cases vary more in prognosis than in therapy. Every effort should be made to avoid bringing on pain. In some cases it may be well to put the patient to bed for a week or two. Ordinarily, it is sufficient to limit activity to that which is compatible with comfort, remembering that upward inclines, a head wind, especially if cold, a full meal, straining at stool, venery, and emotional vagaries are all inimical. More or less of these the intelligent patient finds out for himself. But it is our business to go into details, hoping through patient and persistent precaution to bring about, sooner or later, such adjustment or compensation in the heart as may markedly prolong life and render it very tolerable. Here, as in other aspects of the senile heart, the sum of small advantages may add up to very great therapeutic value. Diet, bathing, occupation, temperament, are all to be carefully considered.

It does not seem to Shattuck that tobacco should be absolutely and always interdicted. A sick man should not be deprived of any legitimate consolation, and the varying tolerance of tobacco by different people is notorious. A smoking doctor is likely to be more merciful than a non-smoker, but each should be on guard against his personal prejudices.

The details of medicinal treatment of true angina depend somewhat on origin—whether this be infectious or non-infectious, and if infectious, whether of luetic or other origin. Medicinal treatment is usually of minor though still of real importance. Strychnine is to be avoided as tending to heighten reflex excitability. Digitalis is indicated only in so far as myocardial failure is suggested by symptoms other than pain. Small doses of potassium iodide can seldom be harmful, and seem to be of value even in non-luetic cases. How far this value is suggestive in origin is hard to say. The average patient to-day is no less willing to carry out other directions when reminded three times daily that he is under medical supervision.

USE OF CAFFEINE IN DIGITALIS ARRHYTHMIAS.

In the *American Journal of the Medical Sciences* for September, 1915, BARTON asserts that all the irregularities of the heart-beat which are brought about by digitalis tend to be removed by caffeine. Although in many cases digitalis arrhythmia will spontaneously disappear when the drug is stopped, instances arise, unfortunately too common, in which after prolonged digitalis administration the conductive system is so depressed that serious results may arise. Under these circumstances the administration of caffeine will be of service and is therefore strongly indicated. The action appears to be due to the increase in irritability of the conduction system produced by the caffeine, which antagonizes and finally overcomes the depressing effects which digitalis exerts upon the auriculoventricular bundle.

ACUTE PYELITIS OF PREGNANCY.

In the *Journal of the Medical Society of New Jersey* for September, 1915, PRICE states that the treatment consists of complete mental and physical rest, the elevation of the patient into a Fowler position, the use of a fluid diet, and the administration of urinary disinfectants such as urotropin 30 grains per day. If this medication causes tenesmus, as it occasionally does, benzoic acid or one of the benzoates may be used. It is well to remember that urotropin is particularly helpful in infections with the colon and typhoid bacilli. James Burnett, writing in the *International Clinics*, 1912,

urges the free use of potassium citrate; he recommends 30 grains every three hours till the urine is rendered strongly alkaline, then a reduction in the dosage. Poultices over the affected region often prove grateful, and cold sponging may be resorted to for the fever. Meara feels encouraged in the use of autogenous vaccines; he reports some cures. De Lee advises the knee-chest or elevated Sims position three times a day for ten-minute periods, and urges the use of vaccines only after delivery. In very rebellious cases Williams practices the induction of premature labor; he finds that as soon as the uterus is emptied of its contents and contracts firmly, the ureters, freed from the upward traction, at once assume a normal position, drainage is quickly established, and therefore a cure follows very soon.

Urologists urge ureteral catheterization and pelvic lavage with various astringent disinfectants. Geraghty favors pelvic lavage in uncomplicated cases of pyelitis, particularly if they show a chronic tendency. He experimented with various solutions such as argyrol, protargol, liquor formaldehydi, carbolic acid, aluminum acetate, and silver nitrate; he has concluded that silver nitrate and liquor formaldehydi are the most beneficial. He gradually increases the strength of the silver nitrate, using as high as five per cent in obstinate cases. It is his opinion that a case of pyelitis is not entirely cured until there is a persistent absence of pyogenic organisms and pus cells.

For the prophylaxis of acute pyelitis of pregnancy, one must be mindful of the hygienic and dietetic laws peculiarly applicable in this state; plenty of fresh air, wholesome unirritating food, warm clothing, frequent warm baths, and moderate exercise are essential. The strain on the urinary tract from the hyperfunctionation, incident to pregnancy, should be relieved by the occasional administration of a refrigerant diuretic, such as bitartrate of soda, and the danger of fecal stasis should be forestalled by keeping the bowels in good condition. Last, but by no means least, the examination of the urine of pregnant women should be made frequently and with more thoroughness than is usually accorded it; if albumin be present in more than a trace, the urine should be examined microscopically for the presence of pus cells and pyogenic organisms.

In conclusion the writer adds that in his opinion the pyelitis of pregnancy is a complication which is at present often overlooked. This is true, not so much because we are prone to be satisfied with a snapshot diagnosis, for nowadays scientific accuracy is the aim of even the most unassuming of practitioners of medicine, but more because our attention has not been called to this condition with sufficient emphasis and insistence. The writer feels convinced that all of us can recall instances in which painful, febrile states were concomitants of pregnancy, to which we gave such diagnoses as malaria, lumbago, or la grippe; some of these were undoubtedly cases of pyelitis. With a closer study of the signs and symptoms and a livelier appreciation of its possible incidence in pregnancy and also the puerperium, we will find this condition a more frequent complication than the present rather meager literature would lead one to believe.

THE INFLUENCE OF INTRAVENOUS INJECTIONS OF NEOSALVARSAN ON THE ARTERIAL BLOOD-PRESSURE.

ROLLESTON in the *British Medical Journal* of August 21, 1915, reaches these conclusions:

1. The average of both the systolic and diastolic blood-pressures on the days after the injection is generally lower than before injection, the fall in the systolic being slightly more marked than in the diastolic pressure. This fall, however, is very probably not a direct result of the action of the neosalvarsan, and, in part at least, may be due to rest in bed.

2. The blood-pressure seven hours after the intravenous injection of neosalvarsan is usually lower than it was before. The fall in the diastolic pressure is slightly less than

that of the systolic pressure. The fall cannot be explained as due to fever.

3. As compared with the blood-pressure taken seven hours after the intravenous injection of neosalvarsan, the average of the blood-pressure estimations on subsequent days is usually lower. This is more marked in the diastolic than in the systolic blood-pressure.

4. During the actual intravenous injection of neosalvarsan both the systolic and diastolic pressures are nearly always higher than on other occasions. This appears to be due to excitement. During the operation the pressures may vary considerably, the systolic blood-pressure being more affected than the diastolic.

5. The blood-pressure before the first injection of neosalvarsan is nearly always higher than the blood-pressure before the second injection of neosalvarsan, but here again mental excitement may be responsible.

6. Finally, the general effect of intravenous injections of neosalvarsan is rather to lower, certainly not to increase, the arterial blood-pressure.

VALUE OF RECTAL FEEDING.

ADLER in the *American Journal of the Medical Sciences* for October, 1915, states that every one having experience with rectal feeding by the introduction of a pint or more of liquid nourishment at a time is impressed with the discomfort and difficulties of continued nutrition by this means.

An examination of stools shows how little food is really absorbed. On this account, for the past four years, Adler has been using the drop method as first introduced by Murphy for saline solution.

Four to eight ounces of peptonized milk with one pint of 4-per-cent sugar solution has been given three times daily. This method can be kept up for two weeks without discomfort. In a few cases they have caused cramp-like pains for the first day or two. In one or two cases vomiting has been produced. In but one case has it been necessary to give up the rectal feeding.

That the nourishment is carried well up to the intestines is shown by his experience in a case of fecal fistula after an appendix operation.

The patient was unable to retain any food by mouth, and rectal drop feeding was attempted. The dressings became invariably soaked with the enema after a few hours, showing that the fluid had made its way without difficulty through the length of the colon.

With rectal enemata of bismuth suspension there is no difficulty in obtaining a complete picture of the colon, but bismuth never enters the ileum except in the unusual case of patent ileocecal valve.

With the drop method the same results were observed; no bismuth passed into the ileum.

In order to obtain some idea of absorption of rectal feedings by the Murphy method, metabolism investigations were made on cases of gastric and duodenal ulcer with no abnormality of nutrition. After the second day of artificial feeding, with nothing by mouth, the colonic intakes for four to six days in nitrogen were compared with the output in the urine and the return loss per rectum. Daily total nitrogen estimations of the urine were made, while all the matter passed per rectum in the same period was collected, dried to constant weight, and the total estimated by the Kjeldahl method.

The average loss of total nitrogen by urine and stool in these five cases was 12.9 gm. per day. The average loss in nitrogen from metabolized proteid as shown by the total nitrogen of urine was 11.7 gm. per day.

The largest amount of nitrogen Adler was able to supply daily by rectal feeding was 3.9 gm., of which 2.06 gm. were returned with stools. According to the observations of Fr. Müller, the stools of individuals taking absolutely no nourishment contain 0.2 gm. per day. With this deduction from the estimations of the return nitrogen Adler has in no case observed an absorption of more than 50 per cent of the proteid supplied, and it has fallen as low as

30 per cent. The average amount of nitrogen absorbed in these cases was 1.14 gm. per day.

When we compare the amount of nitrogen lost by these cases with the amount it was possible for them to absorb by colonic feeding, we realize how little we accomplish.

The difference between nutritional enteroclysis and normal salt enteroclysis was a little over one-tenth of the tissue albumin loss per day. Over the periods of time that rectal feeding is usually carried out this is from a practical standpoint an almost negligible quantity.

THE ATROPINE TREATMENT FOR THE EXUDATIVE DIATHESIS IN INFANCY.

LEOPOLD in the *American Journal of Diseases of Children* for October, 1915, recalls the fact that some years ago Czerny gave the name of "exudative diathesis" to a group of symptoms characterized by an exudation into the skin and mucous membranes. The skin of infants suffering from exudative diathesis shows some form of eczema, varying in grade from a very mild seborrhea to extensive infiltration, with excoriation. The so-called geographic tongue is seen in some cases. Catarrhal affections of the respiratory tract—coryza, pharyngitis, recurrent bronchitis, and asthma—make their appearance. A catarrh of the gastrointestinal tract is often present. General glandular enlargement with an enlarged spleen may be combined with one or more of the other manifestations. An eosinophilia is found in the blood examination of some of the cases. The exudative diathesis is generally encountered either in very obese or in very thin infants; some of the cases, however, are normal in weight and development.

The eczema, bronchitis, and asthma occurring in infants with other symptoms of exudative diathesis are occasionally very resistant to the ordinary methods of treatment. The very fat, overfed babies are at times greatly improved by reduction in diet with consequent loss in weight. The symptoms occurring in poorly nourished infants occasionally clear up rapidly with proper regulation of the diet and gain in weight. In both classes of cases external treatment of the eczema in the form of ointments is used in combination with the dietetic therapy. With the most carefully combined treatment, however, a certain proportion of the cases fail to improve. The eczema persists for many weeks, months, or even years, and there are recurrent attacks of asthma, bronchitis, and pneumonia. It is for these patients that the atropine treatment is advocated.

Before detailing Leopold's results a brief review of the development of the atropine therapy should be given. Although the cause of the exudative diathesis is unknown, Eppinger and Hess believe that it is an infantile form of vagotonia, and various manifestations are thus due to increased tone in the vagus system. With this theory in mind, Krasnogorski treated a number of infants, ill for many months with the manifestations of exudative diathesis, with atropine, a drug causing, as is well known, decrease of vagus irritability. Six infants, all under nine months of age, were treated. Four of them had suffered from severe grades of eczema and two from bronchitis and asthma. Cures followed administration of atropine in all these infants. No toxic effects, such as flushing and dryness of the skin, dilatation of the pupils, tachycardia, etc., were observed, and Krasnogorski therefore concluded that infants suffering from exudative diathesis were very tolerant to the drug.

During the past year Leopold has administered the atropine treatment to ten infants suffering from symptoms of the exudative diathesis—severe eczema, bronchitis, or asthma. Mild cases were not treated, for he believes that the best test of the efficacy of the atropine therapy is in the advanced and pronounced type. The patients were all institutional babies ranging in age from four months to two years, and were under constant medical supervision. Careful observations were made on the condition of the pupils, skin, pulse-rate, etc. Tempera-

tures were recorded several times daily. The infants under one year were weighed daily, and the older infants once or twice weekly. The results of the atropine treatment on the lesions of the exudative diathesis were excellent; and this despite the fact that no changes in diet were made, and no other drugs administered. One infant died during the period of observation. In this patient atropine had a beneficial effect on the eczema, but in no wise influenced the pulmonary condition, death following a terminal bronchopneumonia.

Atropine was used in a solution of 1 grain of atropine sulphate to 480 drops of water. Three drops of this solution were given on the first day of treatment, and if no untoward effects were observed the dose was increased 1 drop daily until patients received about 30 drops daily (equivalent to 1/16 grain of atropine sulphate). This last dose was given daily for one or more weeks until the manifest signs of the exudative diathesis had disappeared. Smaller doses were then administered for a few more days or weeks. In only one case did untoward manifestations appear; they were very mild, and did not recur after the initial dose of the atropine solution had been reduced. In no case was there any harmful result from the atropine treatment. It was clearly evident from the beginning that infants suffering from exudative diathesis were able to take large doses of atropine without showing toxic effects.

Whether the theory of Eppinger and Hess proves true or false, the fact remains that striking results were obtained in Leopold's series of cases by atropine treatment administered on that theory. From a study of these cases it is fair to conclude that atropine sulphate in increasing doses given over long periods of time is of great value in the treatment of those severe and obstinate manifestations (eczema, bronchitis, asthma) of the exudative diathesis which do not respond to the ordinary dietary and local treatment. It will be Leopold's further object to determine if repeated courses of atropine are required or if a single course will effect a permanent result.

THE SOY-BEAN AND CONDENSED MILK IN INFANT FEEDING.

In the *American Journal of the Medical Sciences* for October, 1915, RUHRÄH says that after a considerable amount of clinical experience he has found that the best method to begin feeding mixtures of soy-bean and condensed milk is to make a gruel composed of one level tablespoonful of soy flour, two level tablespoonfuls of barley flour, a pinch of salt, and one quart of water. This should be boiled for twenty minutes, or even longer, and the water lost in the cooking should be replaced. To this is added condensed milk, varying from 1 to 16 to 1 to 8, according to the age of the child and other circumstances. As a rule this will be found to agree admirably, and may be used in quantities varying from 2 to 8 ounces at a feeding. The feeding interval may be two, two and a half, or three hours, usually three hours, and occasionally, in difficult cases, this may be lengthened to three and a half or even four hours; but Ruhräh has not found this advisable in many cases. The amounts of condensed milk and the strength of the gruel may be varied according to circumstances, using weaker mixtures if there is vomiting, or if there are symptoms of indigestion, or if the stools, after a number of days, do not appear to be more or less normal. The stools of babies fed with soy-bean mixtures are slightly brownish in color, should be perfectly well digested and smooth, and not unlike in appearance those of babies that have been fed upon malted milk. In children who are not gaining, and yet who seem to be taking the gruel well, the amount of condensed milk may be increased to 1 to 8—that is, one ounce of condensed milk, with enough gruel to make 8 ounces, and in exceptional cases, even to 1 to 6, though Ruhräh has rarely found this either advisable or necessary. The gruels may vary in composition, and in older children they may be increased to double the strength advised above—that is, 2 level tablespoonfuls of soy flour and 4 of barley, and occasionally this may be increased still further. If the soy-bean is used too strong, or if it is used with-

out a sufficient amount of carbohydrate with it, as in perfectly plain gruels without either cereal flours or condensed milk, it is liable to cause thin, dark-colored, foul-smelling stools, owing to the high protein and fat content, and the very small amount of carbohydrate present.

These mixtures of condensed milk and soy-bean gruels will be found one of the most valuable additions to the dietary of the infant. On two occasions Ruhräh has encountered a curious idiosyncrasy for barley flour in these mixtures. Following administration of the gruel made with barley flour, there was a sudden and marked general edema, lasting several days. It so happened that he had seen this condition from barley gruel used alone, so that this was stopped in both instances, and the gruel subsequently made with wheat flour in place of the barley flour. In both instances a second attempt to replace the wheat flour with barley was followed by the same edema, so that there can be little question as to the cause of it. As in feeding any cooked food to infants, some antiscorbutic food should be given, and for this purpose orange juice in quantities from a teaspoonful to two tablespoonfuls may be used daily, or at intervals of several days, or even once a week. He has never seen a case of scurvy resulting from these mixtures, but in all cases in which the gruel was used over long periods of time some antiscorbutic food has been added.

The class of cases and circumstances in which this mixture is to be advised may be outlined as follows: When fresh milk cannot be obtained, or when the milk supply is very questionable; in summer, when there is some question concerning the milk supply, and then in instances where the infant is found to be incapable of digesting cow's milk. It will also be found useful in certain cases of intestinal indigestion in infants who, under ordinary circumstances, can digest cow's milk, but who have had their intestinal functions temporarily deranged. It may also be of service in cases of chronic vomiting, and particularly useful as a food after summer diarrhea. Without the condensed milk the gruel may be used as a food in many diarrheal conditions with considerable advantage, but as is the case with every other food, there are many instances in which it will not agree with the child. The use of soy-bean gruels alone without barley or some other cereal may be recommended under very exceptional circumstances. The failure to obtain proper results from the use of the soy-bean has been largely due to an attempt to use it without the addition of some cereal. In the past six years Ruhräh has had a sufficient amount of experience with this method of feeding to know that it can be used without any danger. It will not produce rickets, and with a very small amount of some antiscorbutic food will not produce scurvy. It permits a perfectly normal development as far as bones are concerned, and in successful feeding the infants present the appearance of breast-fed babies. In some of the most difficult cases children are slow to reach the normal appearance, but most of such children that he has had have been those whom he does not believe could have been raised by any other means or only by using a wet-nurse.

A CHEMICAL STUDY OF WOMAN'S MILK, ESPECIALLY ITS INORGANIC CONSTITUENTS.

In the *American Journal of Diseases of Children* for October, 1915, HOLT, COURTNEY and FALES reach the following conclusions on this subject:

1. The use of large individual samples of milk for analyses has advantages not offered by such small ones as have been commonly employed. For a determination of the inorganic constituents large samples are indispensable.

2. In the colostrum period woman's milk has high protein and high ash with rather low fat; in the transition period the protein and ash are lower while the fat is higher; in the mature period (after one month) the composition of normal milk does not vary in any essential or constant way quite up to the end of lactation. The only striking feature

of late milk is a decline in quantity, though there is noted a slight fall in all the solid constituents except the sugar.

3. Of the different constituents of milk the least variation both in individuals and in periods is seen in the sugar. The proportion of this is somewhat higher than the generally accepted 7 per cent; 7.5 per cent is nearer the correct figure.

4. The greatest individual variations are seen in the fat, though the period variations in fat are not marked.

5. The protein is highest in the colostrum period and falls to a little over half the proportion in mature milk, during which period it is seldom over 1.25 per cent; of this about one-third is casein, and two-thirds lactalbumin.

6. The high ash of the colostrum period is chiefly due to the amount of Na_2O and K_2O. Of the salts which make up the ash, the greatest individual, as well as the greatest period, variations are seen in the Na_2O; the least individual and period variations are seen in the CaO, the proportion of which is nearly constant throughout the period of lactation.

7. The largest constituent of the ash of woman's milk is K_2O; this with the CaO together make up more than half the total ash.

8. Although in amount the total ash of cow's milk is about three and one-half times as great as that of woman's milk, the proportion of different salts which make up the ash is nearly the same, the only exceptions being that cow's milk has more P_2O_5 and less iron.

THE PRACTICAL USE OF COPPER SULPHATE IN SWIMMING POOLS.

S. J. THOMAS in the *Journal of the American Medical Association* of September 25, 1915, says that on analysis the pool water in the Taylor Gymnasium at Lehigh University was shown to contain, just after filtration and before any one entered the pool, 10 bacteria per cubic centimeter, and no colon bacilli; after 40 men had been in the pool, although all the preliminary sanitary precautions had been taken, the water contained 5300 bacteria per cubic centimeter, 200 of which were colon bacilli. Bleaching powder introduced into the pool in germicidal quantities is out of the question on account of its disagreeable odor and its irritating effect on the eyes and mucous membrane. Copper sulphate can be used in germicidal quantities without any disagreeable results.

The method of using copper sulphate is very simple. Thomas found as the results of experiments that about one-twentieth (0.04) part of the copper sulphate to a million parts of water, used every day, kept the water pure. This amount cannot be recommended absolutely for every pool. The chemical contents of the fresh water, the number of bathers, the frequency of refiltration, etc., are factors that should not be overlooked. However, for most pools averaging not more than from 100 to 150 bathers per day, and in which the proper care is taken, this amount will prove the proper one.

In order to determine in pounds the amount of copper sulphate to add, the capacity of the pool must first be determined. In the case in which this is known as a certain number of gallons, the problem simply amounts to multiplying the number of gallons capacity by 8.3 (the weight in pounds of a gallon of water), and dividing the weight of the water thus determined by 2,000,000 (the solution being one-half part per million). The result is the weight in pounds of copper sulphate to be added. For example, suppose the pool contains 90,000 gallons of water:

90,000 x 8.3÷2,000,000=0.37 pounds, or about 6 ounces, of copper sulphate to be used.

In case the capacity of the pool is not known, it may be determined as follows: Multiply the length in feet by the width in feet, and the result by the average depth in feet. This will give the capacity of the tank in cubic feet. As a cubic foot of water weighs 62.5 pounds, we now have the formula:

Length x width x average depth x 62.5÷2,000,000=weight of copper sulphate to be used.

The copper sulphate should be added

daily. The method of introduction consists simply in dissolving the required amount, placed in a small bag, such as a 5-cent salt sack, directly in the pool, either by dragging the bag through the pool by means of a pole, or by throwing it into the pool as an object for the bathers to dive for. Another very easy way is to dissolve the disinfectant in a quart or two of water and pour this solution into the pool. No more than enough solution for one treatment should be prepared at one time if it is used in this way. The swimmers soon distribute the dissolved salt throughout the pool.

As to the time of treatment, it is best to use copper sulphate between the two most popular times for the pool, such as at noon if there are large morning and afternoon classes, and at supper-time if there are large afternoon and evening classes. To use any disinfectant just before or just after adding a large amount of fresh water is, of course, simply a waste.

Copper sulphate may be obtained at the present time under the commercial name of blue vitriol for about $7 per hundred pounds. One hundred pounds will last the average pool about a year.

TREATMENT OF SYPHILIS OF THE BRAIN.

In the *Journal of the American Medical Association* of September 25, 1915, IRELAND and WILSON state that the injection of 1/50 grain of mercuric chloride intradurally, by the method of Byrnes, is apparently safe.

Autogenous serum is much preferable to pooled serum.

The reactions are a little more severe than following the Swift and Ellis method of 40-per-cent salvarsanized serum.

A clinical improvement usually appears after about five treatments; 75 per cent of their cases showed this improvement.

A tendency to relapse to their former conditions was observed in about 40 per cent of those at first improved.

The clinical improvement is more marked and rapid than the serologic.

How permanent the improvement will be the writers are unable to state, as the time of observation is too short.

They are encouraged to continue this study, however, and a later report will be given on these patients after further treatment and observation.

The colloidal gold test is the most resistant to change.

It is possible to have clinical general paralysis with a negative Wassermann reaction in blood serum and spinal fluid, but in this series the colloidal gold test was uniformly positive.

The method employed is as follows: About 40 Cc. of blood is taken, under aseptic conditions, from one of the veins of the forearm, and the serum allowed to separate. To 12 Cc. of clear serum is added 1 Cc. of a sterile solution of mercuric chloride containing 1/50 grain, and 17 Cc. of sterile normal salt solution prepared from freshly distilled water. This total of 30 Cc. is heated to 56° C. in a water-bath for thirty minutes. Lumbar puncture is performed and from 15 to 30 Cc. of fluid is withdrawn, and the 30 Cc. of diluted mercurialized serum slowly injected. A 25-Cc. Lüer syringe is used.

In those cases in which neosalvarsan is given, the usual Swift and Ellis technique is used. The serum is administered within twenty-four hours of its preparation. The interval between injections is determined by the condition of the patient.

THE TREATMENT OF NERVOUS SYPHILIS.

RIGGS in the *Journal of the American Medical Association* of September 4, 1915, reaches these conclusions:

1. Every patient with constitutional syphilis, especially in the early stages, should be examined neurologically and serobiologically, and if there be found any symptoms of nervous involvement or an abnormality of the spinal fluid, intraspinal injections of salvarsanized serum should be given until a clinical and laboratory cure is effected. Bernstein advises this procedure as a pro-

phylactic measure in all cases of syphilis, particularly in the primary and secondary stages.

2. Lange's colloidal gold solution is a valuable aid in diagnosis, possessing a marked corroborative value. Paresis gives a characteristic curve (in over 90 per cent of our cases) so constant, say Grulee and Moody, that "one may venture a diagnosis without other findings, either clinical or laboratory." There is a distinctive tabetic curve which was present in 50 per cent of cases. The colloidal gold reaction differentiates clearly between paresis and cerebrospinal syphilis. In tuberculous meningitis the colloidal gold solution reacts markedly. Non-syphilitic cases sometimes give a vague discoloration which may or may not invade the syphilitic zone, but which has no special significance.

3. Intraspinal medication (Swift and Ellis method) is a sane and safe form of therapy, and in the hands of practical men is practically devoid of danger. In cerebrospinal syphilis and tabes, results obtained by conservative workers are most encouraging, and in some cases little less than marvelous. When paresis can be treated in the early, the toxic, stage, before serious degeneration of nervous tissue has ensued, an arrest of the disease may reasonably be expected. Is it too much to hope for a cure?

NITROUS OXIDE OXYGEN ANALGESIA IN OBSTETRICS.

In the *Chicago Medical Recorder* for September, 1915, Lorena Craig reports favorably on this method and advises, as the end of the first stage of labor approaches or whenever the physician deems it advisable, the gases be turned on, using about one-tenth of oxygen to nine-tenths of nitrous oxide. The breathing bag is filled with this mixture, and just before the uterine contraction comes on the nose-piece or face-mask is applied and the patient is directed to breathe deeply and rapidly, keeping the lips firmly closed (if the nose-piece only is used) so that none of the gas escapes through the mouth. Usually six or eight breaths are sufficient to produce analgesia, and the patient is able to work with her pains and yet to be unconscious of painful sensations.

With a little practice one soon determines the number of breaths required to carry the patient through each pain; in fact, the patient is able to control the administration almost entirely herself.

Among the various cases observed, the greatest length of time analgesia was employed was twenty-four hours. The patient had become discouraged and the pains were becoming less frequent and forcible before the administration of N_2O-O was started. After it was begun the contractions became somewhat more frequent and forceful and the patient more hopeful. More progress was made. The amount of N_2O consumed in this case was considered unusually low by Dr. Frank Lynch, who said he thought the small amount consumed was due to the efficiency of the apparatus. Of course, the analgesia was continued in this particular case for a much greater length of time than is usual.

The average length of the second stage of labor in 1500 cases is one hour and thirty-seven minutes, and ordinarily the administration of the analgesia is not begun until the end of the first or the beginning of the second stage. This matter, however, is left entirely to the discretion of the obstetrician.

The effectiveness of N_2O cannot be questioned after observing its use in a number of cases, for the first stage may be rather long and tedious, and as the pains become more frequent and severe with the approaching second stage, the patient becomes discouraged. But with the introduction of gas-oxygen analgesia a marked change is noticed and the patient is able to work with the contractions, knowing she will not be conscious of the intense pain of the more forceful contractions. Just before the expulsion the face mask is applied and a deeper anesthesia is brought about by the use of 2-per-cent O and 98-per-cent N_2O. At this time ether or chloroform vapor may also be added in a small cup at the side of the mask for this purpose, and the vapor

inhaled with the gas-oxygen without removal of the mask.

The question has been raised as to the superiority of oxygen and nitrous oxide over air with nitrous oxide, and Hewitt has stated that the objection to using air is that it contains a large percentage of nitrogen, which is useless for anesthetic purposes. He illustrates this in the following manner:

"In 40 per cent of air with 60 per cent of N_2O, 8 per cent of the air by volume is oxygen and 32 per cent is nitrogen. This mixture containing 8 per cent of oxygen would be the proper amount so far as oxygen is concerned, but 60 per cent of N_2O would not be sufficient to produce tranquil anesthesia; by using oxygen instead of air the 32 parts of nitrogen are replaced by a corresponding quantity of useful N_2O, and using the same percentage of oxygen there is a perfect anesthesia mixture."

Craig's observations have covered a period of about three months in various hospitals, recording the work and effects of different types of apparatus and the varied methods of administration; also the writer's own administration with private cases, using the apparatus designed by Dr. Will Walter, and these are her conclusions based upon this experience.

The most striking thing to her is the tranquillity of the subjects and their anxiety to coöperate; and particularly the often expressed paradox that they felt the pain, but that it did not hurt, meaning, the writer imagines, that they are conscious of pain but are able to endure it much easier than without the use of the gas. When on occasions they have said it did not help, the writer has let them have a pain without it, and they have been only too glad to have it for the next.

Aside from the safety of this apparatus, which is free from pressure, and its ease of control of percentages of the gases, the most useful element is the breathing valve-bag. By its use the bag is held full of the analgetic or anesthetic mixture and placed beside the patient; so that, upon the first sign of approaching pain, she may have the mask applied, and by opening the valve begin the inhalation. She may even do it herself—in fact, she may control the degree of her own analgesia voluntarily and with ease at all times, and she is able to describe the sensations accurately.

CASEIN-MILK IN INFANT FEEDING.

The *Journal of the American Medical Association* of September 4, 1915, contains an article by GELLHORN in which he says that in his experience casein-milk feedings have been found to be successful as temporary food in allaitement-mixte and when it was necessary to wean a very young child abruptly. Although they do not seem to produce any harm during prolonged use, the advantages they offer are not sufficiently clear to recommend their substitution for the ordinary milk modifications in normal children.

They cannot replace breast-milk in some of the severest cases, but in the great majority of nutritional disturbances, as seen in private practice, they will be found to be of assistance. They are indicated in disorders of a fermentative origin, and can be fed in such cases in rapidly increasing doses regardless of the stool picture, provided the child does not develop symptoms of alimentary intoxication. Through their use may be avoided the prolonged or repeated therapeutic hunger periods with their deteriorating influence on the child's organism, which are so frequently the cause of turning an originally mild into a serious disorder.

THE TREATMENT OF TYPHOID FEVER BY STOCK TYPHOID VACCINE.

In the *Lancet* of September 25, 1915, WILTSHIRE and MACGILLYCUDDY write on this topic and reach the following conclusions:

1. Stock typhoid vaccine is a valuable therapeutic agent for the treatment of typhoid fever.

2. The treatment should be started as early as possible with an initial dose of 250,000,000.

3. A reasonable suspicion that a patient

is suffering from typhoid fever is sufficient indication for commencing vaccine treatment.

4. The treatment is quite harmless to patients who may subsequently be proved not to be suffering from typhoid fever.

5. An interval of three days should be given between doses. Shorter intervals are not well tolerated. When a longer interval is given, if four days, the dose should not be increased; if over four days the dose should be reduced.

6. Great care must be used in dosage if secondary infections of the lung are present. If possible, the typhoid vaccine should be combined with a vaccine suitable for the secondary infection.

7. Doses should be continued for ten days after the temperature is normal as a preventive against relapse.

8. Preventive inoculation exerts slight, if any, influence on subsequent vaccine treatment.

THE ADVANTAGES OF QUININE AND UREA HYDROCHLORIDE AS A LOCAL ANESTHETIC.

In the *New York Medical Journal* of October 2, 1915, AMSTER reminds us that quinine and urea hydrochloride is a nontoxic double salt of quinine and urea. In other words, it is a carbamidated quinine dihydrochloride, containing seventy per cent of quinine and eleven per cent of urea. It is readily soluble in water and does not decompose on boiling. It is put up in ampoule form ready for use, but the writer prefers a freshly prepared solution, 0.125 to 0.25 per cent strength, which is made as follows: One tablet containing one and one-eighth grain of quinine and urea hydrochloride is dissolved in one to two fluidounces of sterile water, to which is added five to ten drops of adrenalin solution 1 to 1000. The operator is at liberty to use as much of this solution as the case may require without causing the untoward physiological or toxic symptoms that are sometimes met with after the local administration of cocaine and other dangerous drugs.

The field of operation is prepared in the ordinary way with iodine. The skin is slowly injected with the solution along the entire course of the desired incision, and the same process is carried out in treating the underlying structures, special care being taken against injuring or cutting nerves. In order to produce conduction anesthesia, the nerves should be carefully isolated, and then thoroughly infiltrated with the quinine solution. This procedure is indicated in operations for inguinal hernia, especially the strangulated type. Ordinarily, complete anesthesia is produced in fifteen to thirty minutes, and may last for an indefinite period. The prolonged anesthesia is explained by the infiltration of the nerves and the tissues with a granular fibrin, and the period of anesthesia depends entirely on how soon this fibrin is absorbed.

Gentle handling of the tissues and perfect technique help to prevent shock. Shock no doubt is the result of tugging and tearing tissues, which in turn cause a certain amount of unnecessary bleeding. Many patients object to the pain produced by the initial puncture of the hypodermic needle, but this is usually overcome by spraying the skin with ethyl chloride before the anesthetic is introduced. A preliminary injection of morphine and atropine may be given, an hour before operation, in nervous cases. An assistant or a nurse should always be at the patient's head to distract attention during the entire course of operation, and the patient's eyes should be covered and all unnecessary noises avoided.

Some operators use especially constructed syringes, but an ordinary glass syringe of 10-Cc. capacity will answer the purpose. Many men have had excellent results with quinine and urea hydrochloride, while others have apparently been unsuccessful with this method, their objections being sloughing of the tissues, incomplete anesthesia, or healing by second intention.

These poor results may be due to various causes.

Sloughing of the tissues. Many men have unfortunately encountered this complication, and, after inquiring into their cases very carefully, the writer was informed by

some of them that they had used solutions ranging from 0.5 to 3 per cent, and they had invariably administered stock solutions instead of using freshly prepared ones.

Incomplete anesthesia. The writer, personally, witnessed the technique of several men who now condemn local anesthesia, and discovered that their unsuccessful results appeared to be secondary to faulty technique, and not to quinine and urea. Instead of first anesthetizing the skin, they promptly injected the underlying tissues without treating the skin, and after a lapse of one or two minutes the operation was begun. As a result of this technique, their patients would squirm all over the table and would cry out with pain, so that general anesthesia would have to be resorted to in the end.

Healing by second intention. In performing operations under local anesthesia, especially minor operations, the writer has noticed that some men seem to forget the first principles of asepsis, and the care that is ordinarily taken in general narcosis is not followed out in the same degree with this mode of anesthesia. Other men, instead of taking pains slowly to inject the skin and underlying structures, hurriedly infiltrate the tissues, thus forcibly distending them with the solution, and they consequently get an analgesia that is produced by physical means, instead of depending on the action of the fibrin that is slowly deposited by the quinine and urea. A necrosis of tissue often results after such technique and delayed union follows. This series embraces the type of cases in which general anesthesia was contraindicated, such as cardiac and vascular diseases, pulmonary diseases, nephritis, profound anemias, senility, minor operations, and patients refusing general anesthesia.

The writer's experience with this mode of anesthesia covers a period of six years, and the results obtained thus far have been most gratifying. Postoperative pneumonia, a dreaded complication of general narcosis, is absolutely unheard of with the use of quinine and urea anesthesia. His group of cases covers a large field of surgery, including inguinal herniotomy, femoral herniotomy, appendicectomy, colostomy, cholecystostomy, salpingo-oöphorectomy, suprapubic cystotomy, tenorrhaphy, amputation of fingers and toes, rib resection for empyema, operation for pedunculated submucous uterine fibroid and polypus (vaginal route), laceration of cervix and perineum, urethral caruncle, inguinal and cervical adenitis, thrombosis on the internal saphenous vein, varicocele, hydrocele, enlarged prepuce, gangrene of testicle and epididymis, periprostatic abscess, ischiorectal abscess, hemorrhoids, carbuncle, epitheliomata of face and scalp, alveolar abscess, sebaceous cysts of scalp, lipomata, foreign bodies of hand and foot, ingrown toe-nails, exostosis of tibia and fibula, bursitis, abscess and benign tumor of breast, abscesses in other parts of the body, lacerated wounds, etc.

In this series, quinine and urea hydrochloride had been used exclusively, with the exception of an operation for a large ovarian cyst. Here an unusual amount of traction had been used in delivering the cyst, and it became necessary to administer a few whiffs of nitrous oxide. In another case, general anesthesia had to be resorted to for a few minutes in freeing an embedded retrocecal appendix.

PITUITRIN EXTRACT IN OBSTETRICS.

FRIEDMAN states in the *New York Medical Journal* of October 2, 1915, that according to most writers the ideal time to inject the extract is in the second stage. Friedman has used it, methodically, in the first as well as in the second, and has not seen any ill effects. P. A. Hendley emphasizes the fact that it is a valuable aid in shortening the long, and often exhausting, first stage of labor. It is also true that the third stage of labor is considerably shortened.

Pituitrin should, of course, not be used in typically normal cases, nor when such contraindications exist as obstruction, nephritis, or high blood-pressure suggesting an impending eclampsia.

Another good use of pituitrin is in the

differentiation of pregnancy and labor as pointed out by Buthin and Bandler: "Injection of hypophysis extract will start uterine contractions if pregnancy has reached term, but if not the effect is transient, and additional doses will have no effect." Since the drug can be used only to sensitize the uterus and not to stimulate contractions, it is quite easy to understand its action in such a procedure. In using this method as a test, it would not be wise to inject a full dose, since 0.33 Cc. will serve the purpose.

The addition of pituitrin to the obstetrical armamentarium has robbed the complication of placenta previa of its horrors and diminished risk as a bad omen in the third stage of labor. Hanah and Meyer, Madill and Allen reported good results in a number of cases of placenta previa. In Friedman's case of placenta prævia lateralis, the events of all the stages of labor simulated those of a normal one.

The few points to be remembered are these:

1. Small doses of pituitary extract act better than large ones.

2. Large doses are harmful, producing supersensitization of the uterus, thereby causing the danger of extensive laceration of the perineum and rupture of the uterus.

3. It is an excellent oxytocic, especially in placenta previa, and atony of the uterus.

4. Lastly and most important is that it is the "medicinal forceps," acting as a *vis a tergo* instead of a *vis a fronte.*

INTRASPINAL TREATMENT IN SYPHILIS, WITH ESPECIAL REFERENCE TO THE SPINAL FLUID FINDINGS.

In the *Medical Record* of October 2, 1915, LEVISON reaches these conclusions:

1. The effort to treat syphilis of the central nervous system by direct intraspinal injection has a rational basis in the inefficiency of treatment by the older methods and also from the results of intraspinal treatment by more recent methods in meningitis, poliomyelitism, and tetanus.

2. The cell count of the spinal fluid is a variable factor and cannot be utilized as a criterion of cure or improvement in a given case.

3. It is the consensus of opinion that therapeutic remedies administered by mouth or into the blood stream do not reach the spinal fluid in sufficient concentration to influence bacterial involvement of the central nervous system.

4. Intraspinal injections of salvarsanized serum or neosalvarsan in proper dosage is not a dangerous procedure in careful hands.

5. Intraspinal injections will relieve pain and a great many of the symptoms of syphilis of the central nervous system.

6. It is possible in some cases to render the laboratory tests of the spinal fluid negative if the treatment is continued sufficiently long.

7. The method should not be discarded, but continued until its proper place in therapeutics is definitely determined.

GALYL, A SUBSTITUTE FOR SALVARSAN AND NEOSALVARSAN.

FOERSTER in the *Lancet* of September 18, 1915, tells us that galyl is best administered by means of intravenous injections, as intramuscular injections are painful and may lead to necrosis, as does salvarsan. Any of the methods used for the latter drug are admissible. Personally, the writer prefers the infusion method, as it gives the best guarantee against infiltration of the soft tissues, and fairly concentrated solutions seem to him to be better borne than weak dilutions—a view which also applies to salvarsan and neosalvarsan.

The results have been excellent. An immediate—from the very next day on, as one patient remarked—improvement followed upon the administration of galyl, and all the lesions disappeared within a very short time. One injection is quite sufficient to heal a very large chancre, and mucous plaques heal in a very few days. All secondary rashes respond well and quickly. The effect upon the general health is that of a tonic.

Salvarsan, whether employed intravenously or intramuscularly, does not yield any

better results. With equal dosage it would be inferior. Even when the writer compares the results given by the first (experimental) tubes of salvarsan (606 Hy) with those obtained by galyl, he is unable to find any superiority for the German drug. Being one of those who had occasion to handle salvarsan before it became common property, and having used it ever since, he wishes to state that he is decidedly under the impression that the salvarsan sold of late by the German manufacturers is much less potent than the experimental tubes given out by Ehrlich in the beginning, and neosalvarsan is weaker still. Galyl appears to the writer to be superior to both salvarsan and neosalvarsan with regard to its symptomatic effect upon primary and secondary lesions. This is a considerable advantage, as these lesions are the most virulent and dangerous, and require a rapid cure owing to the risks they imply for the community.

With neosalvarsan galyl shares its solubility, which has made the former so popular.

All the writer's cases were injected under unfavorable conditions. Most of them had to come up by omnibus or train and returned immediately, or in less than two hours, to their homes. There can be no doubt that the ill effects could be reduced, or even excluded, if the patients were injected in a nursing home or hospital and were kept under observation.

Vomiting was noted once after the third injection. The patient brought up egg and other matter and confessed to having had breakfast only two hours previously. The vomiting in this instance was self-inflicted, and would certainly also have occurred had salvarsan or neosalvarsan been used.

With the doses 0.3 grm. and 0.4 grm. no ill effects were observed. With 0.5 grm. the following took place in three cases, and this seems to be the only drawback worth considering: Almost immediately after the injection the patient became flushed and slightly dyspneic. This was rapidly followed by pallor. The pulse became small and almost imperceptible, varying between 100 and 120. As the heart-beats became feeble the limbs became numb and cold. In one instance pain in the stomach was complained of. These phenomena, however, pass off very quickly, and in none of the writer's cases was there the slightest reason for alarm. Some people being more susceptible than others, all risks can be avoided by starting with small doses, excluding patients suffering from heart trouble, and allowing an interval of more than eight days between the injections. The vascular disturbance itself could be treated by means of intragluteal injections of adrenalin, as recommended by Milian for salvarsan disturbances, or, as the writer prefers, by means of a hypodermic injection of ether, if deemed necessary.

Galyl is akin to salvarsan in its composition, and therefore headache, slight fever, diarrhea, etc., may occasionally be noticed. These accidents are trivial and require no special comment.

The "therapia sterilisans magna" so bombastically proclaimed by Ehrlich and his followers was never taken seriously by the judicious, and the events have shown its futility. It would be unfair to the drug and to the patients were one to expect from a single injection of galyl a complete cure, and not to take advantage of the lessons taught by the experience with salvarsan. In the writer's opinion massive doses are to be deprecated. In the case of salvarsan they have given rise to more trouble than all the organic and inorganic "water faults" (Wechselmann, Emery) and other factors discovered by Ehrlich's partisans. Salvarsan poisoning is a serious matter, and there are, unfortunately, but few cases that come early enough to be aborted. In most cases a chronic intermittent treatment is indicated, as in former days. What has changed is the detail. Making use of the various remedies, tests, etc., at one's disposal, each case has to be treated according to its merits. The most rational procedure appears to the writer to consist in the removal of the urgent symptoms by means of a few injections of galyl, starting with 0.3 grm. in the case of adult males, and 0.2 grm. in

the case of females, and following this up with mercurial treatment. A rest is then given, and the treatment resumed in due course, guided by the serum reaction, and carried out as required in each individual case.

The writer is well aware that various important questions connected with the drug, such as its effect upon tertiary lesions, its influence upon the serum reaction, etc., require investigation, and that a great deal of further experience is necessary before a definite opinion can be formed on the merits and demerits of galyl. His clinical results, however, have been so encouraging, and he has seen most virulent syphilitic lesions heal so rapidly under its influence, that others may wish to give it a trial. As far as he can tell at this stage galyl appears to be "every bit as good" as salvarsan, and it is to be hoped that it may be tested more extensively.

Considering its price it may prove a blessing to military hospitals, infirmaries, and other large institutions.

THE IMPORTANCE OF THE PERSONAL EQUATION IN THE TREATMENT OF THE TUBERCULOUS.

The *Medical Record* of October 2, 1915, contains an article by SWAN in which he advances the following practical points:

Patients are sometimes worried and nagged by their overanxious and indiscreet family and friends. It may be a very difficult and delicate matter to handle, but often a patient's improvement will depend on the physician's detection and management of these incompatible people. Some one's facetious remark that a physician must also be a policeman, if he would successfully treat the tuberculous, contains much truth.

Worry about finances or anything else may do immense harm. Even though we may not be able to remove the cause of the worry, we may help the patient to be philosophical about it and to minimize its importance. The attainment of a cheerful state of mind may be almost as helpful as removing the trouble itself. The writer has often been impressed with the importance of cheerfulness, content, and hopefulness as a therapeutic measure, as well as the effects of various depressing mental and nervous factors in the causation of lowered resistance. In looking over the histories of 740 cases of tuberculosis treated during the past fifteen years, he finds that 129 show reasons for believing that some form of nervous depression was at least an important causative factor. A large proportion of the earlier histories were carelessly taken and give no evidence at all bearing on the subject. He feels certain that it is much more commonly the cause than these figures indicate.

The great mistake and cruel injustice of sending people ill with tuberculosis far from home without sufficient financial resources to enable them to live under proper conditions and for a sufficient time without worry and embarrassment, has often been noted. But those who practice in health resorts still see so much distress from this cause that it cannot be overemphasized. Getting well of tuberculosis is a long process, and the cost of living and of care suitable to the patient's needs is usually greater in a health resort than in one's own home. A better climate will rarely overbalance lack of proper living conditions or worry and anxiety in obtaining them. Moreover, distinct harm is likely to come from advising a plan which the patient is financially unable to carry out.

The prolonged physical and mental rest and the limitations necessarily imposed during a "cure" sometimes become so irksome as to be a real detriment to the patient. In such cases finding out and making available suitable diversion and mental occupation may be the means of changing failure into success. The prescription must be suited to the individual, else harm rather than good may be done.

All these considerations help to show the need of personally taking the histories of our patients and getting into close confidence with them, in order that we may know all the factors in their lives which have to do with their powers of resistance.

They should also indicate the danger of giving routine directions based on a physical diagnosis alone and of treating our patients as a class. We need to make a sort of social service diagnosis and to do the kind of work done by social service workers if we would most efficiently help our patients in the personal struggle to get well of tuberculosis.

THE USE OF PITUITRIN IN INEVITABLE AND INCOMPLETE ABORTION.

O'CONNOR in the *Lancet-Clinic* of October 2, 1915, states that in his view the current opinion as to the effect of pituitrin on the pregnant uterus is that it should not be used until the second stage of labor, and that prior to term its effect on uterine musculature is negative. Whether this product in any dosage could bring on either an abortion or premature birth the writer is unable to say, but that it will assist natures' efforts to empty the uterus at any stage of pregnancy, once the process is fairly under way, can be readily demonstrated by any one. The more advanced the pregnancy the more distinct and palpable the uterine contractions will be, but even during the early weeks of gestation when abortion is threatened every evident manifestation will practically invariably follow its administration, viz., an increase of pains and the passage of clots and intrauterine contents. A brief summary of the cases in which O'Connor has employed this drug during the past year would, he believes, sufficiently convince any reader that its routine use in such cases is not only justifiable but indicated.

Any one familiar with the administration of pituitrin in labor is cognizant of certain after-effects beyond those so useful and valuable on the uterine musculature. The labor is shortened. Twilight anesthesia is safer than morphine and hyoscine anesthesia. The afterbirth is passed promptly; the patient voids readily within a few hours, owing to a diuretic action and the increased tonicity of the bladder musculature; the bowels usually move without a purgative; and the patient often remarks, in comparison to previous experiences, of a general feeling of well-being. Exhaustion and many of the disagreeable after-effects of a tedious and prolonged labor are usually noticeable by their absence. As it largely obviates the necessity for forceps the condition of both the new-born and the mother is unquestionably improved, both as to comfort, safety, and satisfaction. That this same drug will soothe the sufferings and render less dangerous and safer the treatment of the numerous accidents with which an untimely interruption of pregnancy is so frequently complicated will, the author believes, be soon almost universally acknowledged.

The author is fully aware of the fact that up to the present but little has been written on the subject, but he believes that this is due to early reports of negative results. Watson, in the *Journal of the Canadian Medical Association,* states that in the induction of abortion or premature labor, or in the treatment of that already in progress, its effects are uncertain, but may be good if sufficient dosage is given. He also states that it is a marked synergist to ergot and heightens its effect distinctly. Hofstatter, in Germany, also voiced a similar opinion in 1913, but remarks in another part of his paper that the lack of results may have been due to insufficient dosage or deficient standardization. These reports antedate the period of both reliable methods of standardization and the marketing of this drug in ampoules, which lessens its deterioration, and hence cannot be accepted as final. The addition of pituitrin to ergot plus the non-interference treatment, suggested by Winter and corroborated by Benthir, will unquestionably reduce both the morbidity and mortality of abortions in the future.

In all probability but few women have met death as a result of the bleeding attending an abortion, but many have unquestionably been temporarily at least invalided as a result thereof. With the subject of infection the author is cognizant of both an added morbidity as well as mortality. Puerperal infections to-day are compara-

tively rare, but such, unfortunately, is not the case in abortions. The principal reason thereof is that the cases require similar measures of management, and the profession, as a whole, is not sufficiently versed in this lesson. Operative or surgical measures of treatment in cases of incomplete abortions are to-day being recognized as both unnecessary and fraught with danger, especially when infection is present. There are, of course, certain indications for surgical interference, such as uterine perforation with peritonitis, distinct abscess formation, etc., but medical, mechanical, and biological agents are steadily preventing the necessity of surgery.

It is not compatible with the scope of this paper to discuss in detail the various features of postpartum or abortion infections or their treatment, except to state that the lack of aseptic precautions in the criminal induction of abortions, the aseptic carelessness of the physician with his too frequent vaginal examinations or instrumentations and the use of douches, are the usual causes of almost all of the infections, and are the things to be religiously avoided. It must be realized that infection is not only more frequent in abortions than labor at term, but that in many cases it is due to the physician's lack of foresight. Many of the examinations are unnecessary, and unless distinctly indicated it is always best for a patient that the physician make external examinations only. It must be realized also with Winter and Benthir that medical rather than surgical measures will result in a decidedly lessened morbidity and mortality.

It seems but reasonable that the following lines of treatment in O'Connor's opinion should be the standard for cases of inevitable and incomplete abortions:

1. Avoid every possible vaginal examination. Never resort to any kind of vaginal or intrauterine treatment, and under no circumstances permit the use of a douche.

2. Instruct attendants to keep everything that is passed until it can be inspected. Remember that cramp-like pain indicates an unemptied uterus, and that one Cc. of pituitrin administered hypodermically every three hours, if necessary, in combination with a reliable preparation of ergot by mouth, will aid nature in removing the retained products and preventing complications.

3. Patients should be kept in bed for at least ten days, but should be instructed to get out and use a commode for evacuation from both bowel and bladder. If there is any evidence whatsoever of infection the patient should be kept in the Fowler, or semisitting, posture day and night until all danger is past. Hot, moist bichloride packs to the vulva and heat to the lower abdomen are advantageous, especially during the first three days of normal cases and continuously during infections. Appropriate sera or vaccines, stock and autogenous, may be used in treating infections, and surgery should be utilized only when the indications are practically absolute and distinct.

EXERCISE IN THE TREATMENT OF SEVERE DIABETES.

ALLEN in the *Boston Medical and Surgical Journal* of November 11, 1915, says that it seems advantageous to give exercise especially after a meal containing carbohydrate or other food tending to produce glycosuria, although, when patients are able, they exercise at all times of the day. Short periods of vigorous exercise with rests between are preferred to long, slow walks, which might tire the patient even more. The exercises now suggested are running up and down stairs, jumping rope, throwing a heavy "medicine ball," and turning somersaults. Tennis and other hard games should probably be beneficial. At first, precautions may be taken against the nervousness and sleeplessness sometimes caused by overweariness in weak patients. Otherwise, patients are worked right up to the limit of their strength, somewhat like athletes in training. In regard to the reduction in weight which has been advised in the fasting treatment, the question has arisen as to what kind of tissue it is de-

sired to reduce. The answer seems to be that it is desirable to reduce fat and reserve tissues, and build up active muscular tissue. With this end in view, the emaciated, flabby-muscled diabetic is turned into an athlete as far as practicable. During exercise no attempt is made to shield the patient against excitement, invigorating cold, or any similar influences previously dreaded in diabetes. It is hoped that an end may be put to the pale, feeble diabetics, dressed in double underwear while hugging the radiator, and growing more neurasthenic all the time. Some of the exercises above mentioned are planned to shake up these patients and break up their former bad habits, both physically and psychically. The patients feel much better; they are kept occupied during the day, and sleep well at night. Hunger may be partly satisfied by vegetables and bran cakes, but in general exercise has increased appetite less than it has increased the power to satisfy appetite. The patients can take a somewhat more liberal diet, and enjoy the possession of somewhat greater weight and strength; but the increase of weight in this instance consists of muscle, not fat.

It is hoped that this addition to the treatment of severe diabetes will prove of especial value to children, to patients with persistently low tolerance, and perhaps to some of that class previously so hopeless, viz., tuberculous diabetics. For the ordinary type of patients it may be a means of getting results somewhat more quickly and thoroughly, and leading to a higher degree of both comfort and usefulness. The value of exercise is strictly limited. It cannot raise tolerance very high, and it is not equal to the dietary regimen in importance. Results will be unfortunate if it is used merely as a means for shortening the hospital care of the patient, or for building up weight and strength at the cost of more important considerations. The radical and permanent control of the diabetes is the essential matter, and is to be judged by such things as glycosuria, acidosis, and blood-sugar, not by a temporary sense of well-being. A stern programme of fasting, low diet, and reduction of weight is still necessary as before, but it is hoped that results may be more beneficial with the use of exercise as an additional detail of the treatment.

THE USE OF WHOLE MILK IN THE ARTIFICIAL FEEDING OF INFANTS.

The Practitioner for November, 1915, contains an article by VINING in which he states that the milk must be citrated in the proportion of two grains of sodium citrate to each ounce of milk. Toward the age of six months the amount may be reduced to half that quantity. Some observers only use one grain from the start, and the writer is not sure that it does not do just as well. The citrate may be ordered in solution, containing a little chloroform water as a preservative, of such a concentration that each teaspoonful of the solution contains sufficient citrate to deal with, say, half a pint of milk.

How much milk should a baby be given? There appear to be three ways of answering this question. The first is a mathematical one. By considering the relationship of the size of the baby to the condition of its environment, we arrive at the amount of heat being lost, and by calculating the food requirements in calories of heat we can gauge the amount of milk necessary to the half-ounce.

The second method consists in giving the child as much as the weekly exchequer will allow. As long as the volume of food is sufficient to fill the child's stomach, its qualitative value is of minor importance. One of the commonest causes of crying and wakefulness in babies is not wind colic and indigestion, but starvation. When a helpless baby is being given, at one month old, two ounces of a mixture containing five drachms of milk and eleven of barley water, it is suffering from flatulent starvation; and after nine months of such feeding, whole milk only being given toward the end, it can be likened to a melon, large and succulent, but containing little of value.

The third method—and in the writer's opinion the only one worth following—con-

sists in first providing a food which contains all that is necessary for the growing child, and can be digested by the average baby, and then allowing the child to indicate the amount it really does require, by those indications of progress that nature has provided, namely, the condition of the stools, the amount of sleep, its weight, and its physical and mental development. Some babies will take more at one feed than another, and most expect and want more after the bath and on waking in the morning than toward the end of the day. A winter baby wants more than a summer one, but the latter requires more liquid, which can be given as drinks of water between the feeds. To allow a child three ounces of food, when it could do with four, means fretfulness and crying until the next feed. We want less humanizing of the food and more of the feeding.

The question still has to be answered as to when exactly whole milk can be started. This question should rarely arise at the start, seeing that the mother should be prevailed upon to feed the child at any rate for as long as she possibly can. If the child has reached the end of the first three weeks or a month and an alternative has to be resorted to, whole milk can be given at once. If the feeding has to be resorted to from birth, the writer, personally, dilutes half-and-half at the start, and increases as rapidly as possible to whole milk; it rarely happens that one is unable to have the baby on whole milk by the end of three weeks or a month. Usually, whole milk can be given within a few days. In the case of most mothers, it is a week or ten days before the true milk is available, so dilution up to that time is quite reasonable. The special difficulty that must at all costs be avoided is constipation. What suits one baby will not always suit another, but as a general rule liquid paraffin or equal parts of the confections of sulphur and senna appear to be most useful.

No originality is claimed for citrated whole milk feeding. The method has been before the profession for ten years, but up to the present it has not taken to it in a way that one would expect, seeing the amount of reliable evidence before it. The chief reason is probably the honest prejudice that still exists, the casein bogy being the cause of most of the trouble. It requires a good deal of courage for a young practitioner to order whole milk when the mother, nurse, relations, friends, and neighbors are totally averse to it, and until this prejudice is broken down the feeding difficulty will continue to exist. Whole-milk feeding has never been put forward as a method of feeding which will prove successful in every case, and certainly never in preference to breast feeding, but it is recommended as the method of choice when breast feeding is out of the question, and the experience of many goes to show that a baby who will not take whole citrated milk will not take cow's milk in any reasonable dilution. Such babies certainly do exist, and when they are found some other method has to be tried.

ACUTE APPENDICITIS IN CHILDREN.

Writing in the *American Journal of Obstetrics* for November, 1915, AYNESWORTH reminds us that in the great majority of all cases of appendicitis in children some form of family medicine has been given before the physician has been summoned, and unless the physician is very alert and the case an outspoken one, all will have had a laxative and many a drastic cathartic. This is due to two things, namely, the great frequency of acute infections and gastrointestinal ailments in which this form of medication is the correct line of procedure, and the great similarity of the early symptoms of appendicitis to the above diseases. The relative sudden occurrence of appendicitis contributes to an occasional oversight by the physician. Laxatives are distinctly contraindicated and should never be given; even when appendicitis is only suspected, time should be taken in which to clear up the diagnosis before resorting to laxatives. Developments in physiology during the last few years have made clear the harmfulness of laxatives in appendicitis. It has been demonstrated that the normal peristalsis in

the cecum and as far as the middle of the transverse colon is toward the appendix until all food products are prepared for entrance into the stage of hard feces. In the cecum the water is absorbed and the remaining food undigested is finally disposed of, excepting very small quantities which are taken up in the distant parts of the colon.

The peristalsis toward the cecum is rather violent and continues until the ascending colon is empty. Laxatives send food products along the intestinal tract and keep the cecum and ascending colon full and tense, which develop waves of antiperistalsis. The musculature of the appendix is a continuation of that of the cecum, and any movement originated in the cecum is transmitted to the appendix. This recurring activity of the cecum with the violent writhing of the appendix during these waves will tend to invite rupture and to spread inflammation, and it will, in addition to the damming up of material in the appendix itself, especially in children, as the cecal end is usually quite wide and often funnel-shaped, increase intra-appendiceal tension with its attendant dangers.

If nausea and vomiting are present and continue, which occur only after peritonitis has supervened, gastric lavage is invaluable. With great pain and tenderness ice applications will often relieve, but if this fails heat may do better in some patients. An enema in order to relieve the colon may be given provided it is a small one and no pressure is used, as otherwise antiperistalsis may be started with all of its evils. Constipation does not have all the evils which the family physician may attribute to it; the effort to overcome constipation in acute appendicitis has sent thousands to an unnecessary grave. The temperature is rarely of sufficient height as to require attention. In reality, there is no medical treatment for appendicitis in a child any more than there is in the adult, but many cases have to be watched until the diagnosis can be made. Then there are cases which, for various reasons, will not submit to surgical measures, and therefore must have medical treatment during the entire time. It is for these patients that there is a medical treatment.

When the diagnosis has been made it is proper to relieve pain by appropriate doses of some opiate if other measures fail, and not before. The writer knows how widely surgeons differ about the use of this one drug in appendicitis, but he has no hesitancy in relieving pain with morphine after the diagnosis has been made and operation refused. If operation is permitted no time is lost in getting this done; but if it is refused, unrelieved pain will do infinitely greater harm than opiates used with discretion in case other measures have failed to make the patient comfortable. In fact, he is not sure but that the constipating effect of opium producing intestinal calm is not beneficial in those who will not submit to operation.

Apparently the Fowler position has lost vogue recently, as have many other doctrines founded upon mistaken physiological ideas; however, it might be well to elevate the head of the bed. "Rectal drips" are not always well borne by children, but when taken kindly they are apparently valuable. No water or food should be given to these patients except in rare instances. Often in young children the "drips" are badly borne; water in small quantities frequently will allay their craving and do less harm than if they were permitted to beg for it. Gastric lavage does not have the place in the treatment of peritonitis in children that it has in adults.

Every child with acute appendicitis should be operated upon if seen early; this means before the inflammation has spread beyond the appendix, and has rather loose reference to the number of hours after the attack has begun. The "hour period" has done great harm, for pathology does not heed time in its processes. Some cases are hopeless within a few hours; others have recurrent attacks for years and finally get well. Often patients are taken to the surgeon with great distention and rapid pulse, spreading tenderness and general muscle rigidity, with more or less cyanosis, rapid

respiration, and all the evidences of septic absorption. To operate upon such a case is to invite disaster; many more will get well by the treatment outlined under medical measures. Between these two extremes are often met patients with localized processes with every evidence of an abscess or at least of local peritonitis without spreading. These should be operated upon only when the general body resistance is good; if an abscess is walled off it is safe and easy to drain and to get the appendix if readily accessible, but if the appendix is difficult to locate, or if it forms a wall of an abscess, it is best to leave it and to take it out later after the antibodies have fortified the patient against infection. It is surprising how well the patients withstand secondary removal of the appendix even though pus is still in the wound. The cardinal principles of abdominal surgery in children are a short operation, a small amount of handling of tissues, and drainage when infection is present.

MORPHINE AND SCOPOLAMINE ACTION UPON THE INTACT UTERUS.

The *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, contains an article by BARBOUR in which he reaches these conclusions:

1. The contractions of the uterus in living animals can be recorded conveniently by the method described in this paper. The organ is suspended in a glass cylinder made continuous with the peritoneal cavity. The whole is filled with warm oil kept gently circulating by the movements of the diaphragm.

2. Neither morphine nor scopolamine causes profound changes in the activity of the pregnant or non-pregnant uterus of decerebrate cats. A temporary increase in tone such as described for the isolated organ is often seen in the case of both drugs. Morphine in decerebrate cats may cause indirectly a relaxation of the uterus if a marked depression of the circulation be produced.

3. Morphine (0.02 gramme) increases the tone of the uterus of rabbits under paraldehyde.

4. Doses up to 0.02 gramme each of morphine and scopolamine given together possess little or no action upon the uterus.

5. The statement that large doses of these narcotics inhibit the activity of the uterus is not applicable to any direct action of morphine or scopolamine upon this organ. The delay in labor produced by either or both of these drugs is probably due entirely to their cerebral action.

THE RESPONSE OF THE SURVIVING UTERUS TO MORPHINE AND SCOPOLAMINE.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, BARBOUR and COPENHAVER state that the wide employment of morphine and scopolamine in obstetrics suggests the desirability of more accurate knowledge of the action of these drugs upon the uterus. Therefore, studies have been undertaken upon the response to morphine and scopolamine, given separately as well as together, on both the surviving and the living uterus of mammals. The combined action is of further interest because of the numerous experiments of Bürgi, Kochmann, and others, which indicate that morphine and scopolamine in their action upon the central nervous system exhibit a true synergism.

The following are the results of experiments on surviving pregnant and non-pregnant uteri of guinea-pigs and cats:

1. Morphine, in concentrations of from 0.05 to 0.1 per cent, and sometimes as low as 0.002 per cent, stimulates the isolated uterus to an increase in tone.

2. Scopolamine, in concentrations of 0.005 to 0.06 per cent, and sometimes as low as 0.001 per cent, increases the tone of the isolated uterus. In this respect, therefore, it appears to be about ten times as powerful as morphine.

3. The inhibitory action upon the tone of the uterus described by Kehrer for large doses could be obtained with neither of the above substances. Very high concentra-

tions of either tend to produce a tetanic condition of the organ.

4. No synergism or antagonism could be demonstrated in the direct action of these drugs upon the uterus.

THE REMOVAL OF SUPERFLUOUS HAIR BY ELECTROLYSIS.

BATHURST in *The Practitioner* for November, 1915, states that the strength of current applied should be from .75-1.5 or 2 milliamperes, 1 milliampere being generally quite sufficient. If the pantostat be used, it may be set by experiment for each individual case, and will remain nearly constant, requiring only slight adjustment as resistance is overcome, throughout the sitting.

Of the greatest importance is a good light, and if daylight is not good a headlamp, which may also be worked from the pantostat, combined with Zeiss's binocular magnifiers, gives great assistance. The writer has derived no help from ordinary lenses held in the hand.

The patient is placed on a couch with the head well back, the operator standing at the head of the couch with the pantostat on his left, if he uses the right hand for the needle-holder, so that he may be able to regulate the current if necessary with the left hand. The needle should be sterilized in a spirit flame before each insertion.

The needle is usually connected with the negative pole, and the indifferent electrode to the positive. The result of this is that hydrogen is liberated wherever the needle is in contact with the tissues, together with the alkalies, sodium, and potassium, which effect the destruction of the papilla. The success of the operation on each individual hair depends upon the introduction of the needle into the hair follicle, so that the point may reach and destroy the papilla. This may be effected with a current of 1 milliampere in 5 to 20 seconds, and one may fairly assume success when after such treatment the hair is found to come easily out of the follicle, as if it had merely been lying in it with no attachment.

If the hair needs any force for removal, it should be assumed that the papilla has not been destroyed, and the operation should be repeated.

At a sitting from 20 to 50 hairs may be removed, but care should be taken not to attack too many in any given area on account of the danger of inflammation being set up. A skilful operator may count on permanent destruction of 60 to 80 per cent of the hairs treated.

A difficulty which is sure to be encountered at first, and which may be met with at any time, is that connected with the introduction of the needle. Fair hair of a fine silky quality on a fair skin presents difficulties of vision, which a good light and suitable lenses may do much to overcome.

There are also anatomical difficulties:

The neck of the hair follicle may be constricted so closely as to offer great obstruction to the entry of the needle.

The direction of the hair follicle beneath the skin may be different to that expected, and the hair as seen is not always a guide to that direction.

The needle may inadvertently be directed into the duct of a sebaceous gland instead of along the hair sheath.

A difficulty frequently met with is the heaping up of epithelial cells round the follicular opening and in close contact with the hair itself. Practice and experience alone can help to overcome these difficulties.

The immediate result of the electrolysis which is noticeable is the bubbling froth round the needle at the mouth of the follicle caused by the liberation of hydrogen. This is greater in proportion to the moisture round the hair. Hyperemia of the skin is observed as the result of the electrical stimulation, varying in degree in different individuals. This hyperemia passes off in the course of an hour or so.

The number of sittings necessary and their frequency vary in different cases. One or two sittings a week may be given at first, and their frequency gradually diminished. The work, necessitating as it does the closest attention and care, should never be undertaken in a hurry or under

any but favorable conditions, but only when time and circumstances permit of the strictest attention to detail.

While any obvious scarring is evidence of bad workmanship, it should be recognized, and explained beforehand to the patient, that where a large number of hairs have to be treated on a small area of skin, some alteration of the general texture of the skin is unavoidable.

THE PRESENT STATUS OF TWILIGHT SLEEP IN OBSTETRICS, BASED ON A COLLECTION STUDY OF OVER 2000 CASES.

In the *American Journal of Obstetrics* for November, 1915, RONGY states that a summary of the results of the various investigators, as well as his own experience, brings forth the following conclusions:

1. That if the method was practiced according to technique of Gauss in fully 90 per cent of the cases, the results were uniformly favorable to both mother and child. Complications and untoward effects took place in those cases only in which the dosage, as directed by Gauss, was not strictly adhered to.

2. The standard (stable) preparation of scopolamine was, at first, used but little. Open-market preparations of hyoscine were employed, and this, in all probability, accounts for a great number of patients who suffered from marked restlessness. With the introduction of the stable (Straub) preparation of scopolamine, this factor has been greatly diminished.

3. Morphine, or narcophen, was not repeated except in extreme cases of restlessness.

4. Nearly all agree that the treatment should not be instituted until there are definite signs of active labor.

5. It is interesting to note that fully 90 per cent of the patients were treated in a special room assigned for this purpose.

6. Seventy-five or eighty per cent of all cases treated were primiparæ. The average duration of treatment in primiparæ was seven hours, in multiparæ four hours. The average number of injections in primiparæ was five and one-half, in multiparæ three.

7. In about 60 per cent of cases the first stage was apparently shortened. All are unanimously agreed that the second stage is definitely prolonged. The third stage does not seem to be influenced.

8. Ten per cent of the cases showed various degrees of restlessness requiring restraint.

9. Four cases showed signs af active delirium during the postpartum period, but all recovered in a comparatively short time.

10. Treatment was discontinued in four per cent of cases for the following reasons: (*a*) Too early administration of the drugs; (*b*) disproportion between fetal head and pelvis; (*c*) cessation of labor pains; (*d*) marked alterations in the fetal heart sounds; (*e*) repeated injections without any apparent effect.

11. There was no maternal mortality which could possibly be ascribed to this treatment.

12. Labor was terminated in primiparæ by the use of forceps in 26 per cent of these cases. However, fully 80 per cent of these were low forceps, which merely required lifting the head over the perineum.

13. A general anesthetic was used during the stage of expulsion; and in most instances chloroform was the anesthetic of choice. Ethyl chloride, ether, and somnoform were also used.

14. Seventy-eight per cent of babies cried spontaneously; 16 per cent were born oligopneic and required active resuscitation; 3 per cent were born asphyxiated; 3 per cent were stillborn—12 of these, or 1.2 per cent, may be accounted for by well-recognized pathological findings, such as transposition of the viscera (two cases); monstrosities (two cases); macerated fetus, cerebral hemorrhage (autopsy), etc.

Of the remaining 18 cases, or 1.8 per cent, the writer is aware of a number of instances in which large doses of either scopolamine or morphine, or both, were given.

15. The treatment is contraindicated in: (*a*) primary inertia; (*b*) labor associated with hemorrhage; (*c*) feeble fetal heart

sounds; (*d*) multiparæ giving history of short labors.

"Twilight sleep" has its greatest usefulness in primiparæ, particularly during the first stage of labor where the dilatation is progressing slowly.

16. It is the consensus of opinion that amnesia, with varying degrees of analgesia, should be our aim. However, the majority consider that the successful termination of a case depends, primarily, upon the degree of amnesia induced.

17. Most investigators are of the opinion that "twilight sleep," in properly selected cases, will become a permanent addition to our obstetric armamentarium. We must, however, realize that the great enthusiasm which was created by the introduction of this treatment may in a measure account for the high percentage of successes. In addition, we must bear in mind that this treatment was carried out by men best fitted for this work under the most favorable hospital surroundings, and it is but natural to expect results that under ordinary circumstances could not have been attained. What the results would be if this treatment were administered in the average home, by men not especially trained in the practice of obstetrics, may be judged by the isolated reports coming from such sources.

It is, therefore, the writer's belief that it would be unwise to adopt this form of treatment to be universal, because the greatest number of women are still confined at their homes, either by midwives or by physicians who have not the time nor the training to practice such a delicate therapeutic measure. However, this should not detract from its value. An analysis of the various reports shows that most investigators are fully agreed that "twilight sleep" is devoid of any danger to the mother, and that by constant and careful watching the dangers to the baby are also eliminated.

Judging from the writer's personal experience, extending over a period of fifteen months, and covering a series of over 350 cases, he feels that the value of this treatment, and its acceptance as a recognized therapeutic measure, will depend upon our interpretation of the physiological phenomena produced by these drugs. If we accept the theory that the semiconsciousness, induced by Gauss' method, prevents the actual perception of pain, although apparently present in all its clinical phases, then labor must be considered painless. Therefore, to refuse to adopt this treatment would be a failure on our part to abide by the trust reposed in us. On the other hand, if the mental state induced does not actually prevent the sensation of pain and the patient is actually suffering, even though pain be modified, then the value will devolve upon the degree of diminution of pain or analgesia, and not upon the want of recollection of pain or amnesia.

Personally, the writer finds it difficult to reconcile the fact that a patient, displaying all clinical evidences of pain, such as crying and groaning, does not actually experience it. However, he is fully convinced that pain, in many cases, is not well tolerated, and that this would warrant the adoption of this method in selected cases; more especially in primiparæ of the highly emotional type, and in multiparæ in whom we anticipate a long and tedious labor.

THE PITUITARY GLAND IN DIABETES MELLITUS AND OTHER ENDOCRINE DISORDERS.

The *Medical Record* of November 13, 1915, well says that diabetes is nowadays regarded generally as a disorder of multiple etiology. It is a variable symptom-complex dependent upon disease of one or more of the organs of internal secretion. This conception has been based partly on clinical observation and partly on experimental investigation. Until recently the pancreas was the chief center of interest in the study of the problem of diabetes, but latterly attention has been shifted mainly to the pituitary gland. That the posterior lobe of this organ plays an important part in carbohydrate metabolism has been demonstrated by Goetsch, Cushing, and Jacobson; while the last two observers, in conjunction with Weed, have shown that electrical stimula-

tion of the pituitary gland causes glycosuria, even when this organ is severed from all nervous connection with the abdominal organs.

The next point of attack has been the study of the histological changes occurring in the pituitary gland in diabetes and in other disorders of the organs of internal secretion. This investigation has been carried out by H. J. B. Fry (*Quarterly Journal of Medicine*, July, 1915). The post-mortem material available for this research comprised eight cases of diabetes mellitus in which disease of the pancreas was also demonstrated, three cases of acute pancreatitis, one case of carcinoma of the pancreas, two cases of myxedema, one case of cystic goitre, one case of Addison's disease, and two cases of hypertrophied thymus. The most important result of this study was the demonstration of definite histological changes in the anterior lobe of the pituitary body in cases of diabetes. These changes consist in the presence of adenomatous masses of eosinophile cells, colloid invasion of the anterior lobe, and areas of cellular degeneration. In cases of acute pancreatitis and carcinoma of the pancreas histological changes in the pituitary are absent or slight. In myxedema there occurs in the pituitary an increase in weight resulting from an increase in the connective-tissue elements and a hyperplasia of the chief cells. In goitre there is a hyperplasia of the chromophile cells, especially of the eosinophilic cells, and an increase of colloid material in the interglandular cleft. No histological changes were observed in the pituitary gland in the case of Addison's disease or in the case of status thymolymphaticus.

Fry presents a tentative explanation of the activity and mode of secretion of the pituitary gland. He states that the eosinophilic and basophilic cells are derived from the chief cells by the formation of zymogen granules. The granular cells represent a stage of active secretion, and glandular activity is greater toward the center and posterior border of the anterior lobe. From the granules is formed the colloid which is temporarily stored in the interglandular cleft, and thence passes into the posterior lobe and infundibulum and gains access to the cerebrospinal fluid. The hyaline and granular bodies are derived from cells of the anterior lobe which have been carried into the substance of the posterior lobe in the process of development. It is upon these cells that the call for increased secretory activity first falls. Colloid in the interglandular cleft is then utilized, and if there is an overdemand upon the secretory activity of the anterior lobe, colloid may invade the posterior part of the latter and the cells themselves become rapidly converted into colloid, until finally areas of atrophy of the cells appear. The question is still undecided whether the posterior lobe activates the colloid in its passage, or adds some specific secretion of its own, or acts merely as an indifferent supporting structure.

URINE FORMATION BY THE PERFUSED KIDNEY.

Richards and Plant in the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, reach the following conclusions from a research along these lines:

1. They describe a method for perfusing the rabbit's kidney *in situ* with hirudinized blood under conditions which permit adjustment and measurement of blood-flow through the kidney.

2. When blood-flow through the perfused kidney amounts to 28 to 30 Cc. per minute, fluid is eliminated from the ureter which is comparable in composition with that secreted before perfusion was begun.

3. Rate of urine secretion by the perfused kidney is relatively constant when blood-flow through the kidney is constant: it appears to be independent of changes of pressure in the renal circulation, provided (as in these experiments) changes in pressure do not cause changes in volume of blood flowing through it.

4. Caffeine causes diuresis in the perfused kidney when the rate of blood-flow through the kidney remains constant. The

increase in blood-flow which occurs in the intact animal as the result of the action of caffeine upon the renal vessels is therefore not an essential factor in caffeine diuresis.

5. It is questionable whether 0.9 per cent sodium chloride (5-6 Cc. per kilo) is capable of causing diuresis when blood-flow through the kidney is constant: the same amount of sodium chloride, given as a 5-per-cent solution, is diuretic, even when the rate of kidney perfusion does not change.

6. Phlorizin causes both diuresis and glycosuria in the perfused kidney.

THE MANAGEMENT OF ENURESIS.

In the *Archives of Pediatrics* for October, 1915, NEWLIN well says that the treatment of enuresis, while rather a fertile field for literary effort, chiefly consists at the hands of most practitioners in the administration of belladonna and atropine. While these drugs are almost universally employed there is a long list of medicaments that have been exploited by diverse authors. Atropine, belladonna, strychnine, salol, boric acid, hexamethylenamine, ergot, citrate of potash, bromides, organotherapy, etc., have all been recommended. Occasionally other methods of treatment have been practiced, as the use of faradism, the interruption of the flow during the act of micturition, and so forth. The use of drugs by the writer has been mainly limited to atropine and belladonna; thyroid extract was tried in a small series of cases (6), but did not meet with the results claimed for it, although almost always there was a temporary improvement following its administration. In one case especially did the use of thyroid extract give promise of extraordinary results; this was in a choreic child of thirteen, who had always wet the bed at least once during the night, and who for the first week of treatment stopped the habit entirely. She soon relapsed, however, the thyroid apparently having no effect upon her whatever. The method outlined below of course does not apply to those cases in which some organic basis is found for the incontinence, and is only applicable when, after examination, the conclusion is reached that the condition is due to a neurosis.

The method of management of enuresis, whether it be diurnal or nocturnal, or both, that has given the best results in the experience of the writer consists in the simple procedure of anticipating the involuntary act by a voluntary emptying of the bladder. This, it is granted, is the usual accompaniment of any treatment, but when carried out systematically can preclude the use of drugs absolutely; it gives far better results than when the chief reliance is placed upon medicines, with only perfunctory instructions as to the actual management of the child itself. This method of handling even obstinate cases of enuresis, although it embodies nothing original, is rarely carried out systematically, but when it is so conducted gives almost invariably successful results. The chief obstacle encountered is the difficulty of impressing on the mother or nurse the fact that unless the instructions are absolutely faithfully followed the result is failure.

To the child's attendant is first explained the rationale of the method, and she is made to understand that eternal vigilance is the price of safety; if she hopes to be successful she must devote herself exclusively to the child day and night for the first three or four days. It rarely happens that after the third or fourth day there is need of exhaustive attention. The nurse is given a sheet of paper with the hours of the day and night placed in a vertical row at the left-hand margin under the heading of the day of the week. If the enuresis occurs, say, on an average of every two hours, she is instructed to put the child on the chamber every hour for the first twelve hours. If she finds the clothing wet at any such time the hour is noted on the chart. At night the child is lifted almost as frequently during the early hours—that is, up to eleven o'clock or midnight; after that every second hour is usually all that is necessary for the first night. At the end of the first twenty-four hours she then either has a clear chart or one with several hours marked as indicating the time of the enuresis. On the

second day she is guided by her chart of the previous day, and she may extend the length of time between the voluntary urinations, always, however, anticipating the hours marked as "Wet" on the day before, placing the child on the chamber at least a half-hour before the time indicated. Thus in each succeeding day the intervals are longer; the hours of voluntary urination may be recorded in the vertical column under the date, the act of enuresis being always marked at the hour at which it occurred. If enuresis does occur the intervals on the succeeding day are shortened at about the hours that it was noted. If the case is a diurnal one, the method is easy; if nocturnal, the first two nights are troublesome, but subsequently almost always the intervals can be lengthened so that there is little discomfort to either parent or child. It usually happens that in moderately bad cases from the time the régime is started enuresis ceases entirely, and by the end of a week, in at least the milder cases, the child will go from eleven o'clock at night to six in the morning without wetting the bed.

THE EFFECT OF CAFFEINE UPON THE BLOOD-FLOW IN NORMAL HUMAN SUBJECTS.

The *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, contains a report of a research by MEANS and NEWBURGH in which they report experiments upon the blood-flow of two normal subjects during rest, and of one subject during muscular work.

The action of caffeine on the blood-flow was studied in both subjects while at rest, and in one during work.

The average blood-flow of the two subjects at rest was 4.5 and 4.0 liters per minute; the systolic outputs were 61 and 57 Cc.; the coefficients of utilization of the oxygen-carrying capacity of the blood were 31 per cent and 41 per cent.

With increasing work a steady rise in blood-flow, oxygen absorption, and pulmonary ventilation was found. The increase in blood-flow was produced first by an increase in systolic output until a maximum of 118 Cc. was reached, beyond that by an increase in pulse-rate. This suggested that the supply of venous blood in this subject becomes "adequate" at about 640 kg. meters of work per minute. The coefficient of utilization showed a slight rise during work, indicating a slightly greater economy of the circulation.

After giving caffeine during rest, or when the supply of venous blood is "inadequate," evidence of drug action was found with both subjects. This action consisted in an increase in total blood-flow without a corresponding increase in oxygen absorption, and hence a decreased coefficient of utilization of the oxygen-carrying capacity of the blood. The pulse-rate was unchanged. Consequently the systolic output was increased.

During work probably no other action was obtained from caffeine than possibly an increase in pulse-rate, and consequently slight diminution in systolic output.

It is suggested that during rest when the supply of blood to the right heart is "inadequate," caffeine increases the blood-flow by increasing the venous supply through an action upon some mechanism outside the heart. When the supply becomes "adequate" or approaches adequacy, no such action is obtained.

ON THE ACTION OF COCAINE.

In the *Journal of Pharmacology and Experimental Therapeutics* for November, 1915, KURODA after studying the physiological effects of cocaine reports as follows:

Cocaine therefore first increases the activity of unstriated muscle and then depresses it, whatever be the nature of the sympathetic control. In some instances the phase of increased activity was not observed.

It is argued that the dilatation of the pupil under cocaine arises from direct action on the muscle of the iris and not from stimulation of the terminations of the sympathetic in the iris.

The action of cocaine in first stimulating

and then paralyzing muscle fiber (including that of the iris) is analogous to its effects on other forms of living matter, including that on sensory organs when directly applied to them.

PUNCTURE OF THE CORPUS CALLOSUM IN EPILEPSY.

STIEDA (*Archiv für klinische Chirurgie*, Bd. 105, Heft 2, 1914) reports the use in his clinic for the last five years in the treatment of idiopathic epilepsy of the puncture of the corpus callosum, as suggested by Anton and first performed by von Bramann in 1908. The object of this procedure is to furnish a channel by which the cerebrospinal fluid may pass from the ventricles to the subdural space. This communication is necessary for the nourishment as well as the proper function of the brain. This operation is especially recommended as it causes but slight operative trauma to the brain, is quickly and relatively easily performed, and may be repeated either on the same or the opposite side as occasion demands.

As a result of this operation, in a case of epilepsy with its origin at the time of puberty, the attacks became milder and for two years were almost absent, and then returned in a mild form; in a case of Jacksonian epilepsy with choked disk both conditions were cured and have remained so for 4½ years past; in a case of genuine epilepsy with imbecility and hydrocephalus internus the spasms stopped for several weeks, then returned with less intensity; in two cases having daily attacks with idiocy they ceased for seven months, while the mental condition improved, but one again suffered occasional attacks; one case in a girl beginning at puberty was uninfluenced; in a case of imbecility with two to three spasms daily they stopped for a month and then returned in milder form; a case of microcephalus with epilepsy showed no change; two cases operated upon six weeks since have shown no return. There has been no fatality from the procedure, nor has there been any demonstrable injurious effect.

PLASTIC DRAINAGE OF ASCITES.

SCHEPELMANN (*Archiv für klinische Chirurgie*, Bd. 106, Heft 4, 1915) according to his method of treating ascites by plastic drainage makes a curved incision, under local anesthesia, obliquely upward and outward on each side of the navel, so that a flap of skin and fat is produced tongue-like in shape, with the point downward. The aponeurosis, muscle, transversalis fascia, and peritoneum are then divided by blunt dissection and the fluid allowed to slowly evacuate itself. The larger end of a piece of calf's aorta is then carried in through the opening so that it extends about one inch inside the peritoneal cavity and the peritoneum sutured around it. The remaining portion of the tube is carried downward so that its outer end lies in the subcutaneous fat layer, and is sutured in place with catgut. The flap is then brought down into place and fastened either with silk or Michel clamps, and the line of closure covered with a collodion dressing. The patient is kept in bed for a day and then allowed to be up, and in four or five days discharged from the hospital.

The pieces of aorta are prepared by collecting them under aseptic precautions from calves at the time of slaughter and removing almost all the surrounding connective tissue. A glass rod is passed into the lumen to preserve it, and the pieces of aorta put into a 10-per-cent solution of formol which is changed daily. At the end of two days the glass rod is removed, as the aorta is sufficiently stiff to maintain its shape, and, after four to six days, the preparation is complete and the tissues stored away to be used weeks or months later. When about to be used several of the aortæ are transferred to a normal saline solution, which is renewed daily for several days to remove the last trace of formol.

This method has been used on four cases. In the first case the result was good at first, but later the ascites returned and autopsy showed that the tube had been compressed and obliterated. This was obviated in later cases by the above-mentioned method of preparation of the aortæ. In the second

case the result was good at the beginning, and death which occurred later was due to the cachexia which had developed at the time of operation. In the third case due to heart disease the relief was marked. Puncture which it had been necessary to perform every few weeks was no longer required. Death which later supervened was due to the heart affection. In the fourth case, which is still under observation, the result has been favorable.

The operation is indicated only in cases in which there is interference with the passage of blood from the vena porta to the vena cava. This is chiefly the case in cirrhosis, but is also true in congestion, liver syphilis, and tumors around the portal veins. It is contraindicated in all forms of inflammation.

END RESULTS OF A SERIES OF THREE HUNDRED OPERATIONS ON THE GALL-BLADDER.

BUCHANAN (*Surgery, Gynecology and Obstetrics*, October, 1915) notes that at the Mayo clinic during the year 1914 of 849 cases of operation on the gall-bladder alone, 708 were excised—83⅓ per cent—and that all of the 140 cases that were drained were cases of acute cholecystitis, with or without stone.

Buchanan quoted W. J. Mayo to the effect that while cholecystotomy may be an efficient procedure in gall-stone diseases when the gall-bladder is otherwise normal and the ducts are free, in cholecystitis the method is not satisfactory, since a gall-bladder which can keep up continuous trouble from infection alone, without the mechanical irritation of gall-stones, will probably not be cured by simple drainage, and cholecystectomy will be the procedure to follow.

Crile says that "No adverse effects from cholecystectomy have been seen, provided the division is made at the beginning of the cystic duct, that no gall-bladder is left, and that the division does not at all encroach on the common duct. . . . If acute infection be present, then, in most cases, cholecystostomy should be first performed, followed, if required, by a later cholecystectomy. If the gall-bladder and the cystic duct be approximately normal, then the gall-bladder should be left. If the gall-bladder be thick, contain much scar-tissue, be shrunken, show chronic infection of the wall; if the cystic duct be partially or completely strictured; or if a stone be impacted in the duct, then cholecystectomy should be performed."

Buchanan believes that the fate of the drained gall-bladder that is not totally gangrenous (and totally gangrenous cases are exceedingly rare) lies in the perviousness of the cystic duct. If it is obstructed by an overlooked stone, or by a pressure-necrosis stricture from a previously impacted stone, then that patient stands a poor chance of a cure by drainage only. He believes that no operator can always know the condition of the cystic duct. If the bile flows freely through it during the operation, the probability is great in stone cases and acute inflammations that the gall-bladder will be restored to its function, whatever that is.

If the bile does not flow and a probe, as is usual, cannot be carried into the common duct, no one can tell whether this is due to a small overlooked stone, an organic stricture, or, what is most common, congestion of the mucous and submucous coats of a tortuous duct.

If any surgeon feels that he must make sure of every case, then he must remove every gall-bladder, and unless he be possessed of rare skill Buchanan believes his immediate mortality from cholecystectomy will far outbalance the morbidity of his uncured cases.

The worst that is likely to happen is that the patient is not cured and that he must be reoperated upon for the removal of a hopelessly crippled organ that is permanently out of commission. This is not pleasant either for the patient or the surgeon; but we must remember that it is not a common occurrence, and becomes more rare as the surgeon's skill increases.

Buchanan in his study of end results has included all those cases in which the gall-bladder alone was involved in the disease, and also those in which the gall-bladder only

seemed to be involved, but subsequent events proved that an overlooked stone existed in the common duct. He has included the cases of acute cholecystitis, with or without stone, comprising 32 per cent of the entire number, taking in the cases of empyema of the gall-bladder, of which there were 55, and the cases of total gangrene, of which there were two. He has also included the chronic cases of cholecystitis without stone and the chronic cases of stone in the gall-bladder whether or not the gall-bladder was evidently diseased. The cases operated on secondarily, the primary operation having been done elsewhere, are omitted, as are also the cases in which stone was found in the common duct at the time of operation. He has reported a case as acute if the gall-bladder presented the usual appearance of acute inflammation, namely, redness and thickening with perhaps sponginess and friability.

He has applied to the quiet cases an equally simple test, such as we are accustomed to apply to the appendix, namely, that they should be considered cases of chronic inflammation only if they were thick, white, fibroid, atrophied, adherent, strictured, or hour-glass. In the chronic cases that require microscopical proof and the strawberry gall-bladder, Buchanan's experience has been too limited to be of any value. Perhaps some of the cases which do not appear in his records as gall-bladder cases at all, in which he has examined the gall-bladder and considered it normal, may really have been of this type and should have been subjected to cholecystectomy.

Of 300 cases all have been traced but 18, giving 94 per cent of known results. The cases that are designated as "satisfactorily cured" are such as appear, by the most careful scrutiny of the information secured, to have been completely relieved of symptoms referable to the bile tract. Those stated in the tables to have had unsatisfactory features in their subsequent history (12 per cent of the total number of cures) are set down in detail in a separate table. The uncured cases also are fully exploited in a table of their own.

The question may properly arise as to why 95 per cent of the cases in this series have been drained and only 5 per cent excised. The answer has a temperamental basis, and the principal reason is a certain conservatism or timidity, if you will, in changing a practice which seemed to be giving fairly good results over a period of years.

Analysis of the 13 uncured cases of chronic gall-stone patients shows that 10 of them would probably have been better off with a primary cholecystectomy; in four of these stones were certainly overlooked; and in six the symptoms pointed to obstruction of the cystic duct either from stone or stricture.

Of the 14 uncured cases of acute gall-stone patients, four had stones subsequently scooped out. In these and in the great majority of the acute cases the local conditions were such that cholecystectomy was not to be considered.

In the gall-stone cases 78 per cent were females; in the cholecystitis cases 66 per cent. Only two patients were under twenty years of age—a girl of five and one-half years with empyema, and a girl of nineteen years with stones and a simultaneous acute appendicitis.

In exactly 100 cases was the previous occurrence or not of typhoid fever noted in the history. In 41 of these typhoid fever had been an antecedent, and in 59 it had not.

No patient was known or suspected to have developed cancer of the bile tract after operation. (Graff and Weinert observed cancerous development subsequent to cholecystectomy in four of their 124 cases.)

While stone was afterward found in ten of his cases—a little more than 3 per cent—there was no good evidence that any of these was a case of true recurrence. Overlooked stone occurs in the practice of all operators in 2 to 5 per cent of cases.

Of the ten cases in which stones were here overlooked, in one the patient cured himself by extruding 50 to 75 stones from his sinus; in one the stone was passed by the bowel; in three cases the stones were

scooped from the gall-bladder after dilatation of the sinus with sponge tents; in one case the stones were removed years after closure by cholecystotomy; in two cases impacted stones were removed by cholecystectomy; in one probably by choledochotomy elsewhere; in one probably the stone remains.

Incision was in most cases through the rectus muscle; in many of the earlier cases Kocher's incision parallel with the costal cartilages was employed, and it did not seem that the muscle section tended to hernia production.

Local anesthesia was used in a small proportion of cases and only in very weak patients. It was invariably well borne and did not prevent necessary manipulations, but, naturally, as little as was necessary was done.

The common duct was palpated in most of the cases and drained in some with expectation of finding stone. (Common-duct stone cases are not considered in this paper.) Negative evidence concerning the contents of the common duct was never very confidently relied on.

Much reliance as to prognosis of cure was placed on the flow of fresh bile on the table and within the next few days. Note of this fact was made in 212 cases, and it was found that when the bile flowed freely from the gall-bladder, only 8.5 per cent were not entirely cured; whereas in the cases in which the bile did not flow at all, 45 per cent were not entirely cured.

The margin of the opening in the gall-bladder in all cases operated in the last ten years was overwhipped with a catgut suture and narrowed with a stitch so as to tightly embrace the rubber drain, making practically a water-tight joint.

This overwhipping renders hemorrhage from the vascular structure impossible. Whenever the fundus could be brought to the peritoneum without tension it was anchored there, and there was no complaint of discomfort to indicate that this was not good practice. Buchanan believes this ancient practice in normal cases reduces the liability to adhesions. Where the fundus will not easily reach the parietal peritoneum the gall-bladder is dropped, with the tube secured as described.

In conclusion he states that cholecystotomy is not a satisfactory operation, giving but 81.7 per cent of ultimate cures, taking the cases as they come.

Cholecystectomy would not be a satisfactory operation if employed in all cases by operators of ordinary skill, and perhaps even by the most skilful surgeons.

The personal equation enters so largely into this question that it must be conceded by the advocates of cholecystectomy as well as the followers of cholecystotomy (if any still exist) that the practice that is safe for one operator is unsafe for another.

As a surgeon's experience increases and as he honestly follows his cases and considers their condition, he is more disposed to turn to cholecystectomy; and at the same time he should realize that the too hasty adoption of this course may be attended with an increase in his mortality list.

There is a field for both operations, and that surgeon will have most success who will not only consider the condition of the patient but estimate justly his own capabilities.

INTRACRANIAL TELANGIECTASIS: SYMPTOMATOLOGY AND TREATMENT.

SACHS (*American Journal of the Medical Sciences*, October, 1915) because operations for Jacksonian epilepsy have so frequently resulted in negative findings, calls attention to a group of cases which yield to treatment. This group, though apparently not large, has nevertheless a characteristic pathological picture. A telangiectasis is a congenital dilatation of capillaries without any new-formed blood-vessels, while an angioma is a new growth and only properly so called when new blood-vessels are formed. In some of these cases the process is connected primarily with the capillaries, in some with the veins, and in others with the arteries. In true angiomata no vessels with all three coats developed are found.

The classification of this process might

seem merely of academic interest, but it has most important bearing on the treatment and prognosis. If this is a true new growth, extirpation is the procedure indicated, while if it is a telangiectasis, ligation should suffice. The question naturally arises, Will these thrombosed vessels, if left *in situ*, irritate the cortex, and should they therefore be removed after ligation? If possible the ligation should be planned so that the vessels do not remain filled with blood, but are collapsed after the ligation. They will then atrophy and do no harm. This condition is a favorable one from an operative and prognostic standpoint.

The first case was a boy ten years old, who three months after a fall suffered from convulsions on the left side of the body and fever. The convulsions began in the leg, and complete left-sided palsy developed, which cleared up in a month. A year later monthly convulsions occurred, beginning in the face. There was a left knee-jerk more active than the right and double Babinski and normal eye grounds. On opening the dura a huge bluish mass of vessels protruded so dense in places that the underlying cortex could not be seen. This mass lay over the motor area. There were no branches connecting with the dural vessels. This operation consisted simply in exposure and closure. A month later an effort was made to remove the angiomatous mass, but the patient died.

The second case, a boy ten years old, had his first convulsion when three months old. There have been five since, three of these in the three months preceding admission to the hospital, unconsciousness lasting from one to two hours. The convulsions began in the wrist of the left hand. There were minor attacks beginning as often as five or six times a day. In these the patient was sleepy and had a numb feeling in his hand. Wassermann was negative. Physical examination showed a weakness of the two lower branches of the left seventh nerve on emotional exertion, and a pale telangiectasis over the forehead. The left eye-ground showed an old choroidal atrophy and the right was normal. On exploratory craniotomy an angiomatous process was found in the dura, which on reflecting the dura was found to have numerous connections with the pial vessels. This area of increased vascularity lay over the lower part of the motor area. All the vessels connecting with the pial vessels were ligated and the dural mass ligated above and below; then the dura was closed. Two days after operation the patient had a violent convulsion. Since then he has been well (six months), but there have been three of the light attacks of which he formerly had five or six daily.

SURGICAL ANATOMY OF CLEFT PALATE.

EASTMAN (*Journal of the American Medical Association*, Sept. 11, 1915) observes that the favorable results in operations for the repair of cleft palate depend much less on the operator's skill and experience than on a clear understanding of certain essential facts of surgical anatomy, the blood supply to the sutured palate being of paramount importance. If the dissection made in the preparation of the flaps is so carried out as to avoid injury to the large palatal vessels, it is a comparatively easy matter to insure an adequate blood supply to the united margins. The blood supply to the hard palate is derived chiefly from the major and minor palatine arteries, which are the two divisions of the descending posterior palatine artery, a branch of the internal maxillary. The larger vessel passes down the posterior palatine canal and emerges from the posterior palatine foramen, which is internal to and behind the last molar tooth in the adult and the last premolar in the infant. It runs forward in a groove on the inner side of the alveolar border of the hard palate to the anterior palatine canal, situated near the midline just behind the incisor teeth, where the terminal branch of the artery passes upward to anastomose with the nasopalatine artery. It sends branches to the mucous membrane of the hard palate and the palatine glands. The smaller division of the descending palatine goes to the soft palate, which also re-

ceives blood from the inferior or ascending palatine of the facial artery and ramifications of one division of the ascending pharyngeal, the smallest branch of the external carotid. It is in the making of lateral incisions that the large trunk passing between the anterior and posterior foramina of the palate, sending its largest branches medialward under the palatine mucosa, is likely to be divided or split for a considerable distance, for it is in the groove followed by the vessel that the knife blade fits and runs most easily.

Therefore the lateral incisions for raising flaps should be made as far lateralward as possible, the cut being directed outward against the alveolar process rather than upward against the palate. Likewise in making lateral incisions near the posterior border of the soft palate for division of the levator palatine muscle the ascending palatine artery is quite likely to be divided, this vessel being of considerable importance in the blood supply of the soft palate. It may truthfully be said that much more depends upon an adequate blood supply than upon the method of suturing the flaps. It is most encouraging after the completion of a cleft palate operation that the wound margins are red and not blanched. In rare cases of severe hemorrhage of the palatine arteries it has been necessary to plug the foramina of the palatine artery with wooden pegs. All of the well-known evil effects of hemorrhage may be circumvented with considerable certainty by the simple expedient of avoiding lateral incisions, or if such incisions are absolutely necessary, making them after the flaps have been elevated and the lines of tension determined, so that only small incisions properly placed are required. It is then usually comparatively easy to relieve tension either lateralward or medialward to the descending palatine or at a safe distance in front of the ascending palatine. To elevate flaps at the beginning of the borders of the cleft is as a rule not so difficult as to elevate the flaps through a lateral incision. A convenient practice is to grasp the divided half of the uvula with tenaculum forceps and split the border of the cleft in the soft palate lengthwise, but slightly on the nasal side of the margin. This split should be extended at once up to the posterior border of the hard palate with scissors-spreading dissection, keeping in the gland tissue between the oral mucosa and the palatal muscles; all of the soft palatal tissue may be rendered movable except the aponeurotic attachment of the tensor palati at the border of the hard palate. The aponeurosis and the attached nasal mucosa must be divided with the curved scissors close to the border of the hard palate, the division extending outward and backward, if necessary, almost to the posterior palatine foramen.

The anterior part of the soft palate next to the hard palate for a distance backward of 9 or 10 mm. contains practically no muscular fibers, being composed almost entirely of palatine aponeurosis. Therefore this portion of the palate is quite fixed and must be detached in order that the corresponding side of the soft palate may be moved toward the median line. It is remarkable how this simple step enables one to close, without lateral incisions and without tension, even the very widest defects. In thus dividing the palatine aponeurosis close to the hard palate margin, no muscle fibers are divided, no blood-vessels and no nerves of importance are severed, and it becomes possible to draw medialward the soft palate in almost its entire thickness. The oral mucous membrane of the soft palate is of course continuous with the soft tissues covering the hard palate. Therefore, after detachment of the aponeurotic layer at the posterior border of the palate bones, it is comparatively easy to continue the separation of the oral mucous membrane of the soft palate forward over the hard palate by the use of an appropriate raspatory or periosteal elevator.

One may begin by first elevating the mucoperiosteum from the hard palate, and then dividing the aponeurotic attachment of the hard and soft palates by passing one scissors-blade under the mucoperiosteum and the other in the nasopharynx, and by closing the scissors and cutting the aponeu-

rosis in the nasal mucosa. Since the raising of the mucoperiosteum from the hard palate is rather difficult in some cases, this may be facilitated by first splitting the edge of the soft palate near the edge of the palate bones, then dividing the aponeurosis, and then continuing the loosening of the flap through the split soft palate over on the hard palate following a continuous plane of cleavage. The paring of the edges of the cleft after division of the palatal aponeurosis and the relaxation of the soft palatal tissues at each side may be accomplished by traction on one-half of the divided uvula and cutting off with curved scissors the rounded border of the mucous membrane which might interfere with union. Drawing the half uvula taut with tenaculum forceps and rolling the relaxed border of the cleft toward the oral side, one may readily inspect its entire length, and with curved scissors cutting forward from the uvular end so freshen the mucosa, which may tend to turn around to the nasal side, that no mucous membrane can interpose between the united margins. Sutures at the posterior part of the soft palate must be secure enough to protect against the traction incident to swallowing, since there is a large amount of muscular tissue here. Coaptation sutures may with advantage be reenforced by a relaxation suture along the free edge of the anterior palatine arch—that is, the posterior border of the soft palate. Such tension or immobilization suture is introduced by passing a long curved needle bearing a long linen or hemp thread through the edge of the anterior palatine arch on one side near its base—that is, on the side near the tongue. The thread is drawn through to its middle and secured with a reef knot, leaving the tail of the suture long. At a distance of 3 or 4 mm. from the first or outermost knot, the needle is again passed through the edge of the arch; the tail of the suture is taken up and another reef knot is tied. This process is continued around the anterior palatine arch to its base on its opposite side, the suture crossing in front of the base of the uvula.

In closing narrow clefts of the soft palate additional security is provided by uniting the two split margins of the cleft as suggested by Ochsner. The sutures approximating the nasal mucosa will probably include in their grasp more of muscle tissue than those on the oral side and are of value as tension sutures. In the simple median suture, when the edges of the cleft of the soft palate are split (the splitting is done slightly on the nasal side), one can gain a few millimeters of additional width for the flaps, and this is especially appreciated by those who use mattress sutures for the closure. It is an error to introduce many sutures of any kind. Four or five should be enough if the wound is not under tension.

THE USE OF HIGH-FREQUENCY CURRENT IN THE TREATMENT OF TUMORS OF THE BLADDER.

BUGBEE (*Surgery, Gynecology and Obstetrics,* December, 1915) has written a collective review which he summarizes as follows:

The high-frequency current is an alternating current of from one to two million oscillations per second. When used as a monopolar Oudin current it causes superficial destruction of tissue, or when used as a bipolar d'Arsonval current it causes deeper destruction.

Used in the urinary tract it is the method of choice in dealing with benign papillomata of the bladder.

Malignant papillomata and circumscribed carcinomata of the bladder wall are best treated by wide resection of the bladder wall and destruction of recurrences by the d'Arsonval current.

In cases of extensive carcinoma of the bladder wall, the growth may be retarded and symptoms lessened by the d'Arsonval current.

Certain types of vesical obstruction—due to a small amount of tissue—may be cured by the destruction of this tissue with the Oudin spark.

Inoperable cases of vesical obstruction can be partially relieved by destruction of tissue about the vesical neck.

Failure will follow attempts to relieve such obstructions unless care is exercised in manipulations, and the treatments are given at wide intervals, a small amount of tissue being destroyed at each treatment.

The d'Arsonval current probably assists in dilating the ureter with the olivary bougie, and the Oudin spark may be an aid in releasing a calculus lodged in the lower ureter or at the ureteral orifice.

The Oudin spark may be of assistance in reducing a hypertrophy of the verumontanum or in destroying a urethral papilloma.

The Oudin spark is probably the best known agent for curing venereal warts, herpetic ulcers, and chancroids.

END RESULTS OF BONE FRACTURES.

ESTES (*Annals of Surgery*, September, 1915), as the result of a study by the Fracture Committee of the American Surgical Association, makes the following recommendations:

First, as a general principle, that fractures be treated by a skilled surgeon.

X-ray should be employed by a competent radiographer, or a fluoroscope should be used for diagnostic purposes before the permanent dressing is applied. At least two skiagrams should be taken, and they should be taken from opposite perpendicular directions.

Skiagrams should also be taken after permanent dressings are applied to prove proper reduction, and at the end of the treatment to show the result of the union and for the purpose of a graphic record.

Fractures should be reduced immediately after the injury if possible to obtain and apply proper retaining apparatus or splints. The statistics show markedly better results when the treatment is begun at once. It is, however, not only useless but cruel to subject the patient to the pain of manipulation for reduction unless the surgeon has proper fixation apparatus at hand and the patient is where he may have a permanent dressing applied.

General anesthesia should be employed as a rule to facilitate reduction and prevent pain, unless the condition of the patient contraindicates it.

Neither the non-operative nor the operative method is to be recommended exclusively. Each has its indication and should be employed when required. Generally speaking, the age period under fifteen years is the period in which non-operative methods are especially effectual. In the other age periods up to sixty years, operative methods may with confidence be employed when non-operative treatment has proved ineffectual in reducing or controlling the fragments in proper position. The operation should not be allowed longer than one week after the injury.

The open method when adopted should be employed early. It may be used at any age period, except in senile cases, whenever a skiagram shows a deformity or a position of the fragments which obviously cannot be reduced or when proper efforts at reduction and retention have proved unavailing.

Some form of rigid plate applied directly to the bone or an Albee "inlay" seems to be the best fixation method in operative cases.

Open operations for simple fractures should be undertaken only by experienced surgeons who are thoroughly equipped by training, and who have proper instruments and apparatus to meet all the possible indications of the operation.

The work of this committee has been greatly hampered by the inadequacy of the records submitted for its consideration. A large proportion of the cases had to be rejected entirely, and most of them were so incomplete as to make deductions based upon them possibly misleading.

The first step in the betterment of practice is the study of results achieved by present-day methods. An adequate study is impossible without adequate records.

The committee strongly urges the American Surgical Association to set its seal of approval upon the standard form of record submitted by the committee, and to further petition the American Medical Association to do the same. The committee also urges each member of this association faithfully

to keep these records in his practice, and to see that they are kept in the hospitals to which he is attached.

The committee further recommends that a copy of the approved form be sent to all corporations within the United States of sufficient importance to have their own relief organizations or medical service or both; to all accident insurance companies to be embodied and incorporated in the papers given to the insured, with the requirement that they be filled at the time of an accident involving fracture; to all hospital boards with the request that these records be made a part of the routine records of fracture patients, pointing out that thus not only are the hospital and its surgeons protected in case of litigation, but that most valuable material is being collected to serve for attaining better results in the treatment of fractures.

ONE HUNDRED CASES OF GASTROENTEROSTOMY AS COMPARED WITH ONE HUNDRED CASES OF PYLOROPLASTY.

FINNEY and FRIEDENWALD (*American Journal of the Medical Sciences,* October, 1915) note that the largest proportion of cases in which gastroenterostomy was performed occurred between the thirtieth and sixtieth years, while the largest proportion of cases in which pyloroplasty was performed occurred between the thirty-fifth and fiftieth years.

Of the total number of cases of gastroenterostomy there were 56 males and 44 females, while the total number in the pyloroplasty series numbers 63 males and 37 females.

The duration of the symptoms in gastroenterostomy cases varied from one month to nineteen years, the average duration being nine and a half years, while the duration of symptoms in the pyloroplasty cases varied between one and one-half months to twenty-five years, the average duration being nine and a half years.

In the gastroenterostomy cases the symptoms appeared in the following proportions: pain in 90 per cent (51 males and 39 females); vomiting in 65 per cent (36 males and 29 females); hematemesis in 23 per cent (18 males and 5 females); melena in 44 per cent (28 males and 16 females); retention in 36 per cent (19 males and 17 females); while in the pyloroplasty cases pain was present in 92 per cent of cases (58 males and 34 females); vomiting in 64 per cent (44 males and 20 females); hematemesis in 21 per cent (15 males and 6 females); melena in 46 per cent (29 males and 17 females); retention in 42 per cent (27 males and 15 females).

In the gastroenterostomy series the ulcer cases are arranged as follows: there are 46 cases of gastric ulcer (32 males and 14 females), 38 duodenal ulcers (15 males and 23 females), making a total of 84 cases. In the pyloroplasty cases there are 55 cases of gastric ulcer (36 males and 19 females) and 32 duodenal ulcers (21 males and 11 females), making a total of 87 cases. It will be noted that in both series there is a preponderance of males over females, and of gastric over duodenal ulcers.

In 67 of the gastroenterostomy patients operated on for obstruction 44 were due to gastric ulcer, 14 to duodenal ulcer, and 9 to adhesions, while pyloroplasty was performed for obstruction in 64 cases, for gastric ulcer in 51, for duodenal ulcer in 7, and in 6 for adhesions.

In the gastroenterostomy cases secondary operations were performed in four instances to correct immediate difficulties, while in the pyloroplasty cases secondary operations were required in the same number of instances for a similar purpose.

After gastroenterostomy satisfactory results were secured in 82 per cent of cases, and unsatisfactory in 18 per cent, while pyloroplasty was immediately successful in 90 per cent of cases and unsatisfactory in 10 per cent.

There were seven deaths following immediately upon the operation of gastroenterostomy, while but five deaths followed pyloroplasty.

Of the 77 cases of gastroenterostomy followed during the first year of the operation the results were satisfactory in 84.4 per cent

and unsatisfactory in 15.6 per cent, while of the 82 cases of pyloroplasty the results were entirely satisfactory in 93.9 per cent, and unsatisfactory in 6.1 per cent.

Of the gastroenterostomy cases, numbering 74, followed after the first year of operation, the results were satisfactory in 84.2 per cent and unsatisfactory in 15.8 per cent, while of the pyloroplasty cases, numbering 78, the results were satisfactory in 93.6 per cent and unsatisfactory in 6.4 per cent.

The end results in the gastroenterostomy cases showed a percentage of 77.2 of satisfactory recoveries, while the pyloroplasty cases showed a percentage of 88.6.

It is quite evident from this study that the immediate as well as the final results are clearly in favor of pyloroplasty. The only indications in favor of gastroenterostomy are, as already pointed out, in those instances in which there is an inability to mobilize the duodenum when adhesions are too dense, and in those cases in which there is a thickening and infiltration about the pylorus due to hypertrophic ulceration, conditions, however, which occur but rarely. Again, there is no possibility of excising the ulcers when performing gastroenterostomy, as can frequently be accomplished in pyloroplasty, when they are in the anterior wall.

While in some instances gastroenterostomy may be the operation of choice, nevertheless on account of its comparative unsatisfactory end results it should be as far as possible limited to the relief of stenosis of the pylorus, due to malignant disease; in nearly all other conditions pyloroplasty and pylorectomy are safer and more satisfactory procedures.

It will be remembered that Finney has already reported upon 13 years of pyloroplasty, and from one hundred cases drawn the following conclusions:

The operation has certain advantages over gastroenterostomy, and but few of its disadvantages.

The operation has its greatest indication in the relief of pyloric stenosis due to chronic ulcers, situated at or near the pylorus, and on either side of it, or resulting from cicatricial contraction following the healing of such ulcers. It is often a useful procedure in cases of hemorrhage due to gastric ulcers on the lesser curvature, or to duodenal ulcers which cannot be controlled medically, and which threaten the life of the patient, as well as in the chronic dyspepsias due to ulcers which have not been relieved by medical treatment.

The special advantages of this operative procedure lie in its affording the opportunity to excise all ulcers whether perforated or not in the anterior walls of the stomach or duodenum after direct inspection of the part affected; also the application of treatment to ulcers situated in the posterior walls. It does not greatly disturb the normal relation between the stomach and intestines, as is the case in other operations.

Such objections as are urged against the operation—*e.g.*, its inapplicability in the presence of adhesions surrounding the pylorus as well as in the presence of active and bleeding ulcers, and also because of the fact that the new opening is not at its lowest point, taking advantage of gravity—are more fanciful than real, since the operation has frequently been performed under these conditions with most gratifying results. The interesting experimental work of Cannon and Blake and others supports this contention.

The only contraindications to the operation are inability to mobilize the duodenum when adhesions are too dense, and thickening and infiltration about the pylorus due to hypertrophic forms of ulceration.

In atony or gastroptosis with slight motor insufficiency such as is observed in the water-trap stomach, or in nervous dyspepsia —*i.e.*, in gastric disturbances not dependent upon organic disease—this operation is contraindicated.

From experience with operation the immediate as well as the final results are most encouraging. While in some instances partial gastrectomy or gastroenterostomy is undoubtedly the operation of choice, nevertheless, on account of its simplicity and because of its satisfactory end results, pyloroplasty will continue to retain its position as a safe and useful procedure.

END RESULTS IN 242 CASES OF SIMPLE FRACTURE OF THE FEMORAL SHAFT.

SERGEANT PRICE MARTIN (*Surgery, Gynecology and Obstetrics,* December, 1915) after a careful study of this subject has come to the following conclusions:

In children fractures of the shaft of the femur involve mainly the middle third.

Ninety per cent of all cases of simple fracture of the shaft of the femur in children are followed by complete recovery.

In children at the time of discharge from the hospital (8 weeks) there is no stiffness in the knee.

The average period of treatment of children in bed and with crutches, splints, and bandages is two to three months.

In adults fractures of the shaft of the femur involve mainly the middle third.

Between the ages of fifteen and twenty-five years there is about 50 per cent of complete recoveries, while after twenty-five years the permanent disability is proportionate to the age of the patient. Men above forty years rarely regain strength and activity.

In adults in the absence of shortening there may be a lasting weakness of the leg and thigh. Permanent disability is as a rule associated with shortening, and is to an extent proportionate to the degree of shortening.

The average time in bed and with crutches, splints, and bandages in adults is eight months.

In adults at time of discharge (8 to 10 weeks) there is stiffness of the knee in 100 per cent of cases.

Among adult laboring men 90 per cent never become able to perform their regular occupations.

Among adult males not of the laboring class the great majority are able to perform their regular occupations.

The unsatisfactory results following the weight extension treatment of simple fracture of the femoral shaft in adults suggest that this method is either inadequate in itself or unskilfully applied.

Efforts for obtaining better results in adults should be directed to: (*a*) the employment of more weight in procuring extension, in the effort to entirely overcome the deformity; (*b*) early resort to open operation if extension seems inefficient; (*c*) the systematic use of massage and passive motion continued for months; (*d*) a longer use of crutches than is now customary; (*e*) education of the patient.

SOME EXPERIMENTAL DATA ON THE MORESTIN TREATMENT OF PERITONITIS.

POPE (*California State Journal of Medicine,* Vol. XIII, No. 6) quotes Morestin's communication of two years ago to the effect that sponging out the soiled peritoneal cavity with ether and leaving a quantity of this fluid in the abdomen is an admirable treatment. Auvray reported in corroboration a case of intestinal perforation, in which after cleaning the peritoneum and repairing the perforation he poured a quart of ether in the abdominal cavity and closed his incision after sponging out the excess of ether. The patient made a splendid recovery. Moreover, Delorme contributed an article commending the treatment.

From a theoretical standpoint the use of a toxic irritant, such as ether, in the peritoneal cavity certainly does not seem rational. In the first place, ether is not an antiseptic to any appreciable extent. It is a tissue irritant, a solvent of fats and colloids, and definitely toxic. More than this, one would question the beneficial effect of distending the abdomen with gas of any sort in the presence of an infection.

To determine the value of this method experimentally, a series of twelve rabbits was used, two of which were controls. Eight were treated as follows: Under general anesthesia the animal was laparotomized, the colon drawn out, an inch incision made in the viscus, and a portion of its contents smeared over the peritoneum. The intestinal wound was closed with silk, the peritoneum gently swabbed with sponges soaked in ether, a drachm of ether poured into the cavity, the colon returned, and the abdominal incision closed with silk.

When the ether comes in contact with the abdominal viscera, the animals experience pain, though previously anesthetized; later they seem shocked and are profoundly narcotized. Kymographic records show a pronounced fall in blood-pressure at this point, in studies on dogs. All of these rabbits developed a vicious peritonitis marked by hemorrhagic plastic deposits, purulent exudate, and agglutination of the intestinal loops. Six died within a few days from sepsis or obstruction. Two remained at the end of ten days in fair health, but showed multiple peritoneal adhesions.

Two other rabbits were opened, a drachm of ether poured in the abdomen, and the wound closed. Each developed a purulent peritonitis; one died the third day; the other died from a secondary anesthesia, at which time cultures were made and proved positive to staphylococcus aureus.

This shows that a sterile abdominal cavity, insulted by an irritant such as ether, is not capable of defense against its own intestinal flora. This has been proved before—that carbolic acid or any similar destructive agent, when put on a peritoneal surface with the idea of sterilizing the field, simply destroys the integrity of the tissues to such an extent that infection through the intestinal wall always takes place.

Two control rabbits were laparotomized, had their peritoneum soiled by a colotomy wound, were washed with salt solution, and closed. These made an uneventful recovery, and at autopsy presented a fairly normal peritoneum.

These few experiments show rather conclusively that for rabbits, at any rate, the treatment of the peritoneum with ether—whether infected or not—is a highly improper procedure. Animals so treated develop a purulent peritonitis or sustain an augmented lesion; recovering from this they present multiple peritoneal adhesions and may die of ileus.

The controls, washed with salt solution, do very much better and recover completely.

While this work is rather tardy and its findings unnecessary to convince many surgeons of the fallacy of the Morestin method, in view of its recommendation to army surgeons in the present war, and with the hope that it may deter some of the unwary from using this risky procedure, it is here placed for consideration.

CORRECTION OF DEPRESSED FRACTURE OF THE NOSE BY TRANSPLANTED CARTILAGE.

BECKMAN (*Surgery, Gynecology and Obstetrics,* December, 1915) notes that a large number of nasal deformities resulting from injury are of a depressed type—that is, the injury has crushed the nasal bones so that the bridge of the nose is flattened. The nasal bones are either forced backward upon themselves or separated and pushed out laterally. Many of these can be replaced immediately and held with splints. If not corrected a marked deformity will result. Adult cartilage can be transplanted from one part of the body to another under the same conditions that bone is transplanted, with uniformly good results. This transplanted cartilage is not dependent for its viability upon other cartilage or bone, nor is it necessary to preserve the perichondrium to secure good result. Adult cartilage when transplanted lives with no apparent growth or change in its composition up to three months. In several cases in which adult cartilage was transplanted from the rib into the nose for the purpose of replacing a defect in the tissues there have passed 2½ years with no apparent change in transplant. The tissue accepts the transplant kindly; even in one case of marked infection the cartilage finally healed in firmly. In another instance cartilage was kept in salt solution for five days before being transplanted. Primary union occurred just as if fresh cartilage had been used.

If the nasal bones are widely separated it is best to refracture them and place a lateral splint upon each side of the nose, letting the splint remain for five or six days, in order to procure a suitable narrowing of the bridge of the nose. As soon as it is certain that there are no breaks in the nasal mucous membrane and that the circulation

about the nose is again perfect, the transplantation can be made. Beckman has followed the custom of taking a portion of the costal cartilage from the seventh rib, since the cartilage is much broader at this point and a good-sized portion can be obtained, still leaving costal attachments between the ribs and sternum. One is often surprised to find that a large portion of cartilage is necessary to remedy an apparently small defect. A wax model of the nasal defect is valuable as a guide in shaping the cartilage, which may be easily whittled with a scalpel to any desired size or shape. No attention need be paid to the perichondrium.

An incision a quarter of an inch in length is made transversely through the skin over the nose and just between the two inner canthi at a point where the bridge of the ordinary spectacles rests. There is usually a slight wrinkle in the skin at this point, so the scar is not visible. With a periosteal elevator the skin and subcutaneous tissues are elevated from the bone and cartilage straight down the bridge of the nose nearly to the tip. The separation should not be carried laterally on either side farther than necessary to secure room to transplant the cartilage. The transplant is then slipped into place, and as the tissues have been separated only in the midline, the transplant is held in place and is not dislodged to either side. It may be necessary, however, to place a stitch at the upper portion of the transplant to keep it from slipping upward. The small incision is closed with two or three interrupted stitches of horsehair, and the wound sealed with cotton and compound tincture of benzoin.

CHLORIDE OF MAGNESIUM FOR DRESSINGS.

In *Le Monde Medical,* November, 1915, it is noted that chloride of magnesium was selected as a means of treating wounds, especially septic wounds, on theoretical grounds, though with some practical reasons, in order to dispense with the use of the antiseptics, which yielded our predecessors such brilliant results, in favor of substances which do not exert an injurious action on the living elements of the tissues. That is a conception laden with good intentions. Leaving on one side the first part of the theory, which would open the door to animated discussion, let it be conceded that antiseptics are always useful, sometimes indeed indispensable. Authorities of weight have recommended them *de novo* since they were so violently attacked, but alongside of this aspect of the question there is another, viz., that of liquids capable not indeed of destroying microbes but of infusing fresh vitality into the tissues, thus affording them great assistance in their defense against infection.

Among these liquids mention must of course be made of chloride of magnesium. Dr. Pierre Delbet spoke most highly of it in a paper bristling with facts and observations. Other observers indeed had previously recognized its advantages, and Dr. Rosenblith contributed a specially valuable chapter to the history of this body, which he has been employing for the last six months with very encouraging results.

Dr. Rosenblith in fact started using chloride of magnesium since June 15, 1915, in the hospital wards of the Lycee de Sailly, but as a matter of fact his early trials go back as far as March of that year. He makes use of a 25-per-cent solution in boiled water, and he mixes four tablespoonfuls (60 Cc.) of this solution with a liter of water. This makes a solution of about 12 per 1000. Dr. Delbet also recommends a 12.1-per-1000 solution, which he considers to correspond to absolute isotonus.

When this solution is employed for wet dressings, lavages, or compresses, cicatrization of the tissues according to the partizans of this method takes place much more rapidly than with the usual antiseptics. However abundant the suppuration may be, it soon dries up and cytolysis—*i.e.*, progressive destruction of the cells of the organism—is avoided.

But there is more in Dr. Rosenblith's communication than this restatement of the cicatrizing properties of this substance. He discusses the general properties of chloride

of magnesium when introduced into the organism. He was, as a matter of fact, led to employ this salt for dressings by observation of the results of using a solution of chloride of magnesium and iodide of sodium in rheumatism and pseudorheumatism, where he gave it in hypodermic injections. Observation of these cases, he tells us, seemed to justify the conclusion that these injections in addition to their stimulating influence on most glandular secretions exerted a tropho-cytogenous action on the tissues, modifying the humors so much that they became an unfavorable medium for the multiplication of a certain number of microörganisms.

In this way then chloride of magnesium may be regarded as an indirect antiseptic. In any event it is worth while calling attention to its value as a dressing. It cannot but occur to us that chloride of magnesium is one of the most important constituents of sea water, and that the only one which surpasses it in this respect is chloride of sodium, the remarkable healing and disinfecting properties of which have also been extolled. Those who make use of sea water *per se* for dressing wounds are evidently well-advised, since the sea, the source of all life on this globe, is after all the best preservative of the cellular life even when the vitality of the tissues has been gravely reduced.

CASES OF PENETRATING WOUNDS OF THE ABDOMEN TREATED JUST BEHIND THE BATTLE LINE.

Tartois (*La Presse Médicale*, No. 51, 1915) observes that in the Balkan campaign the rule of treatment was conservative. Also, in France he treated in a conservative manner eight cases of abdominal wounds, all of which died. All came under treatment twenty hours after their wounds, and the cause of death was in every instance peritonitis. Tartois therefore decided on surgical intervention. He treated fifteen perforating wounds by incision and suprapubic drainage; three recovered. He therefore adopted a still more active surgical intervention, opening the belly and making systematic exploration for visceral lesions. Of eleven thus treated five recovered. This study, the result of the experience of one surgeon who under similar conditions applied three general methods of treatment applicable to abdominal wounds, is highly suggestive. Conservatism gave 100 per cent mortality, drainage gave 80 per cent, whilst rational intervention gave 55 per cent. Eight of the cases treated by exploration and intestinal suture were due to bursting bomb. Three of these got well. One rifle shot and one shrapnel shot were also cured. The five cured cases were operated on within five hours of the time of the infliction of the wound. From this experience it would seem that the proper treatment of these cases is a systematic search for intestinal lesions.

In contrast with this single experience Bort (*Deutsche med. Woch.*, June 10, 1915, quoted in the *British Medical Journal*, Oct. 9, 1915) notes the following interesting facts:

As the majority of the cases did not reach the hospital within twenty hours of the infliction of the wounds, and as there was little time for operating on those rare occasions when the patients were admitted early, the treatment of abdominal wounds was invariably and of necessity conservative. While the mortality among the patients suffering from wounds of the intestine was very high, the mortality from wounds of the stomach was surprisingly low.

Altogether 72 cases of abdominal wounds, not including wounds confined to the abdominal wall, were observed. The diagnosis of wounds of the abdominal cavity was made by locating the wounds and detecting symptoms of peritoneal irritation. In 14 cases the diagnosis was confirmed by necropsy. The spleen was wounded in one case and the liver in eight, and though two of the wounds of the liver were complicated by wounds of the lungs and kidneys, only one of these nine patients died.

Among the 50 cases of bullet wounds of the intestine, there were 30 about which exact information was available. Of these

30 patients 27 died, and judging from the course of the bullet it was evident that in every case the small intestine, and in a certain proportion of cases the large intestine also, had been wounded. The necropsies showed that the perforations of the intestine were most numerous when the bullet traveled in the long axis of the body, and in one case as many as fourteen perforations were counted in the same body. The wounds of the intestine were most extensive when they had been inflicted by bullets fired at close range or striking sidewise. In about one-third of the necropsies it was evident that the wounds were so serious that a satisfactory operation was technically impossible. In the remaining two-thirds the conditions were such that an early operation in favorable circumstances might well have saved the patient's life. In some cases the intestines were wounded but not perforated, the bullet having incised the serous and muscular coats, but not the mucous lining of the intestine. Such cases showed that the intestine was sometimes displaced by the bullet without being perforated; and this was the explanation also given by Enderlen, who failed to find wounds of the intestine in three cases in which the bullet had passed transversely through the abdomen.

Of the 30 cases of wounds of the intestine, 14 presented wounds of entry only, while 16 presented wounds of exit also. Among the latter were the three cases terminating in recovery. Curiously enough, in three cases both the wounds of entry and of exit had been inflicted by bullets traveling sidewise. In a considerable number of cases in which the bullet remained in the body, it had either struck sidewise or had been turned into this position after entering the body. The tendency of the modern infantry bullet to turn sidewise was, in Dr. Boit's opinion, largely responsible for the high mortality from abdominal wounds.

Of the 13 cases of wounds of the stomach, 12 were due to rifle bullets and one to a fragment of shrapnel. Only two patients died, both being wounded by bullets, which remained in the body. In the first case death was due to hemorrhage from a branch of the middle colic artery. The bullet had shattered the seventh rib on the left side in the nipple line, and the severity of the wound of the stomach was largely due to its laceration by fragments of rib. In the second case death was due to diffuse peritonitis. The bullet had entered in the mid-axillary line, below the ninth rib on the left side, and had perforated the stomach at two points. The patient had crawled back a distance of 300 meters to have his wound dressed. It was considered that the low mortality from wounds of the stomach in this series of cases was due principally to the fact that the stomach was empty. In practically every case no food had been taken within five to twelve hours of the infliction of the wound. Another important factor was the level at which the stomach was wounded; in the second fatal case the stomach was perforated in the most dependent part of the fundus, whence the escape of its contents was most easy. The prognosis was best when the stomach was wounded in the lesser curvature, and near its cardiac end; and it was worst when the stomach was wounded in the fundus or near the pylorus. The symptoms were very variable. In some cases vomiting occurred at once, and in others it supervened a few hours later. In other cases, again, the wound provoked nausea only. There was every degree of shock, but only in one case was the wound immediately followed by hematemesis. Many of the patients remained lying where they were wounded, while others walked a considerable distance. The pulse was at first almost invariably rapid, and intestinal peristalsis was either reduced or totally inhibited. Rigidity of the abdominal wall was a constant sign. All the symptoms improved with astonishing rapidity, and usually disappeared in two to four days.

The favorable course of these cases confirmed Dr. Boit in his view that conservative treatment was the best for wounds of the stomach. Operation should be attempted only when there was severe hemorrhage, and also possibly when there

were signs of extensive laceration of the stomach. It was more difficult to decide how to treat wounds of the intestine. It was obvious, however, that a man with an abdominal wound should be kept as quiet as possible, and should not be moved before the fourteenth day after the infliction of the wound. Dr. Boit had made a post-mortem examination in two cases in which, owing to the transport of the patients, in one case on the sixth day and in the other on the tenth day, limited peritonitis was converted into a general peritonitis by the breaking down of adhesions. Motor cars for the transport of the severely wounded had not been available for his patients till the seventh month of the war. Previously they had been, as a rule, transported on straw in primitive carts. When a case of wound of the intestine was admitted to the hospital within eight or twelve hours of the infliction of the wound it was, in Dr. Boit's opinion, advisable to operate if other conditions were favorable.

SURGERY OF THE PALATE.

Brophy (*International Journal of Surgery*, November, 1915), whose name is identified with a method of treating cleft palate, which in his own hands seemed to be safe and efficient, contributes, as he does always, a most interesting and instructive paper.

The Brophy operation for the treatment of congenital cleft of the hard palate consists in taking advantage of the opportunity offered in very early infancy to move the bones in contact when they are soft and easily bent, and to carry them into their normal relations.

Bone, at birth, is about one-half organic matter, hence the bending and moving of the separated bones of the palate into contact may be easily accomplished.

To wait until the bones have become more widely separated and more highly ossified, the teeth erupted, and the deformity increased, is to invite complications that should be avoided.

It must not be understood that these bones are crushed, as has been said by men unfamiliar with the operation. They are not crushed. To crush the bones in performing this operation within the first six months of life would be impossible. They are not broken, but, at a time in life when they are soft and flexible, they are bent and moved into correct relation.

This operation is attended by only slight hemorrhage, as no vessels are divided. The hemorrhage which occurs is caused only by the passing of the needles and the scarifying of the borders of the cleft just before its edges are brought in contact.

The surgical shock is less in a young infant than it would be in an older one. The nervous system of a young child is not so well developed, and is not, therefore, capable of receiving the same impressions as it is later in life. Besides, young children usually react better. Moreover, the element of mental apprehension is not present, and we know that alarm and dread are among the most powerful factors in producing shock.

If the muscles are brought into action early, they develop instead of atrophy, hence a good velum is secured with plenty of tissue; whereas if the operation is undertaken later in life, the parts, not fully developed through non-use, cannot so easily be made to subserve the same purpose as tissues which develop through natural employment. It is well known that muscular tissue is more perfectly developed through action.

In cleft palate none of the muscles of the velum can be normally employed when the parts are ununited, hence they remain in a partially developed condition through life. By operating at an early age, these muscles are brought into use and their development is proportional to other tissues.

As a consequence of early operation, there is much less deformity than is the case in a later one, as all the tissues, bony as well as soft, develop naturally and according to accepted types.

When the palatal processes of the maxillæ are united, it will be observed that the bones in the development of the alveolar

processes of the upper jaw assume a form nearly or quite normal, and when the teeth are erupted they will occlude properly with the lower ones, or nearly so. The normal relations in early infancy of the superior maxillary bones are restored by moving them together and holding them there until they unite.

In patients not having sufficient bony tissue to close the cleft by this operation without contracting the arch, the author has found that as time passed the bones developed and the arch spread until, when the upper teeth erupted, they occupied nearly or quite the correct relation to the lower ones.

The most beneficial result of the early operation is that it permits the normal development of the function of speech.

Though realizing that there would be a great advantage in closing the entire palate in one operation, experience has shown that the best results are secured in overcoming this deformity by operating in early infancy, first upon the bones, and as soon thereafter as expedient upon the lip, and finally, when the child is from twelve to fourteen months old, upon the soft palate. By so doing normality is produced in all the parts.

The child operated on in early infancy will be better nourished following the operation and its general physical condition will improve rapidly.

It is fallacious to operate on the harelip before closing the palate. The lip must not be operated upon first. One cannot, without great difficulty, close the cleft of the bones by transfixing them and secure immediate union after the harelip is closed.

LOCAL ANESTHESIA IN HERNIOTOMY.

JACOBSON (*American Journal of Obstetrics and Diseases of Women and Children*, November, 1915) reports on 125 cases of operation on hernias without any deaths, local anesthesia having been used in all. Preliminary injection of morphine and scopolamine is given, sufficient to allay nervousness. In only three of the operations was it necessary for completion to give a slight amount of ether. These were among the earlier cases. A freshly prepared solution of ½-per-cent novocaine is injected about the site of operation; thereafter a wait of ten to fifteen minutes after injection, some care in handling the tissues, together with supplementary injections in the subperitoneal space around the neck of the hernial sac, render the operation painless. Pain may be experienced when intestinal adhesions to the interior of the sac are encountered, but supplementary injections and care in dissecting will avoid this pain. The tissues are thoroughly relaxed, thus allowing transposition and extensive overlapping. The solution used can be rendered sterile by boiling. Such solutions should be made from the novocaine crystals in salt solution and boiled for three minutes, the adrenalin being added just before the solution is removed from the flame. Solutions prepared in this way are always sterile and do not irritate the tissues. The incision does not go beyond the infiltrated area. The author reports but a single infection due to faulty preparation of the solution.

Two points are selected for the entrance of the needle, the first within three finger-breadths of the anterior superior spine of the ilium, and the other just above the spine of the pubis for inguinal hernia. Through these two points, first anesthetized by an ordinary hypodermic needle, the entire field of operation is surrounded by the solution, first under the superficial layers, and then under the deeper external oblique fascia. The author has noticed no toxic effect from the use of the ½-per-cent novocaine and adrenalin solutions which he has employed for these operations. In one double hernia he used 12 ounces of the solution. The average amount of solution employed is from 3 to 6 ounces. It is interesting to learn that one out of every 22 persons has a rupture; in 1913, 3.81 per 100,000 people died of hernia. The frequency of this condition in an otherwise normal individual should make it the most common of all surgical operations.

REVIEWS.

CANCER OF THE STOMACH. By Frank Smithies, M.D. With a Chapter on the Surgical Treatment of Gastric Cancer, by Albert J. Ochsner, M.D., LL.D., F.R.C.S. W. B. Saunders Company, Philadelphia, 1916. Price $5.50.

This monograph upon a very important subject is printed in such large type and heavy leading that it is unnecessarily bulky. These facts, on the other hand, render the text easy of perusal. The author bases his views chiefly upon the clinical study of 921 cases demonstrated to be gastric cancer on the operating table, or in the autopsy room. These cases have been seen by him in the University Hospital in Ann Arbor, Michigan, in the Mayo Clinic, in Rochester, Minn., and the Augustana Hospital in Chicago.

There is, so far as we know, no recent monograph upon this topic, and, therefore, the present publication is timely.

It is needless to point out that the chapter upon the Operative Treatment of Gastric Cancer, by Dr. Ochsner, is written by one who is thoroughly familiar with this important subject. There are few conditions in which careful consultation between the general practitioner and the surgeon are more important than this.

In addition to the surgical chapter upon treatment, there is one by the author upon Non-Surgical Treatment.

Altogether there are twelve chapters, the book concluding with a list of the names of those who are quoted, and an adequate Index.

After giving interesting statistics as to the distribution and frequency of cancer in its various forms, and especially cancer of the stomach, the author takes up the study of its Morbid Anatomy, Symptomatology, and the various methods which are resorted to in its diagnosis.

One of the most important chapters is chapter eight, upon "The Significance of Gastric Ulcer with Respect to Gastric Cancer." There seems much evidence indicating that many gastric ulcers eventually undergo malignant change, and this must be considered in determining whether a case of gastric ulcer is to be subjected to radical surgical treatment.

Many of the ordinary text-books upon medicine consider the problem of gastric cancer sufficiently thoroughly to meet the needs of the general practitioner, but those who are particularly interested in this important subject will do well to possess themselves of this volume, since it may be truly said to present the most recent views in regard to a matter which comes before every active medical and surgical practitioner many times in the course of the year.

THE PRINCIPLES AND PRACTICE OF PHYSICAL DIAGNOSIS. By John C. Da Costa, Jr., M.D. Third Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1915. Price $3.50.

In the six years which have elapsed since the publication of the first edition of this book the new facts which have been developed in physical diagnosis are not very numerous. Nevertheless, certain additions have been made to our methods of investigating disease by the aid of physical diagnosis. These are carefully considered, and when of value are commended in the present volume.

As with most books which reach the second and third edition, the third edition is somewhat larger than the first, although the author has endeavored, by careful revision, to prevent the book from becoming unduly bulky.

The parts of the book which are distinctly new are those which deal with Electrocardiography and the X-Ray Examination of the Stomach. A careful consideration is also given to the newer theories and facts which have accumulated in regard to auricular flutter and ventricular fibrillation. It is these portions of the book to which the purchaser will turn at the present time with the greatest interest and profit.

As Dr. Da Costa has been for a number of years actively engaged in the teaching

of physical diagnosis, he knows the needs of the students and practitioners, and he is able to present the subject in a manner which is both interesting and practical.

SPEAKING OF OPERATIONS. By Irvin S. Cobb. George H. Doran Company, New York, 1915. Price 50 cents net.

It has been said that Irvin S. Cobb is the true successor of Mark Twain. In this little book he has certainly presented the condition of the patient before and after operation in a most ludicrous manner. The book will be enjoyed by medical men, who will recognize things and conditions that they often see, and it will cause equal mirth on the part of the patient who has been "through the mill."

As with many other contributions to literature which are primarily designed to be amusing, many medical men, while being amused, will have facts called to their attention which can be bettered by a little caution and due regard for the patient's feelings.

As a means of obtaining a hearty laugh after a hard day's work, the book is to be cordially commended.

MEDICAL LECTURES AND APHORISMS. By Samuel Gee, M.D. With Recollections by J. Wickham Legg.

We doubt whether many practitioners will desire to purchase this book, although, on the other hand, it may be truly said that its various chapters possess definite information of clinical value. The text is essentially made up of lectures and aphorisms covering a fairly wide field in medicine.

The book opens with the history of a case of cerebral hemorrhage, and this is followed by a consideration of the meaning of the words "Coma" and "Apoplexy." The third chapter deals with Large Heads in Children, the fourth with Aphasia, and the fifth with the meaning of the word "Delirium." The sixth and seventh chapters deal with Nervous Atrophy and Spinal Myalgia. These are followed by chapters upon the Causes and Forms of Bronchitis, and on the Nature of Pulmonary Emphysema and Asthma. There are also chapters upon Enlarged Spleen in Children, Tubercular Peritonitis, Signs of Acute Peritonitis, and Sects in Medicine. After these fifteen chapters, which make up practically half of the volume, are the "Clinical Aphorisms." These deal with a host of symptoms and diseases varying from Hemoptysis, Stinking Expectoration, Hysterics, and Headache, to Myelitis and Diabetes.

As the book covers less than four hundred pages, and the spacing is wide, it can readily be understood that none of these matters are considered in exhaustive detail.

INTERNATIONAL CLINICS. A Quarterly of Illustrated Clinical Lectures, etc. Edited by Henry W. Cattell, A.M., M.D. Volume Four, Twenty-fifth Series, 1915. J. B. Lippincott Company, Philadelphia, 1916.

For many years we have called attention to this publication, which frequently contains lectures or articles of considerable value.

Possibly the most interesting contribution to the present number, which celebrates the twenty-fifth anniversary of its publication, is a brief contribution entitled "The Coming of Age of Internal Medicine in America," by Sir William Osler. Other articles of importance are upon the Causes and Cure of Pellagra, the Duodenum in Health and Disease, and Progress in Obstetrics and Gynecology, by J. W. Ballantyne of Edinburgh.

BANDAGING. By A. D. Whiting, M.D. W. B. Saunders Co., Philadelphia and London, 1915. Price $1.25 net.

This admirably illustrated and expressed brochure upon Bandaging constitutes a complete and efficient guide to this practical branch of surgery. The author recommends that muslin be used as the material for bandaging by all beginners, that they may thus learn how a perfect bandage may be applied, and will soon discover that a similar bandage, except in a few instances, can be applied with gauze. He observes wisely that "accomplishment of purpose, rather than creation of a thing of beauty, should underlie every attempt to apply a

bandage. He classifies them under three headings—the roller, tail, and the handkerchief. This is a serviceable book which can be warmly commended.

THE PRACTICAL MEDICINE SERIES. Under the General Editorial Charge of Charles L. Mix, A.M., M.D. Volume VII, Obstetrics. Edited by Joseph B. De Lee, A.M., M.D., With the Collaboration of Herbert M. Stowe, M.D., 1915. The Year Book Publishers, Chicago.

Lee in his summarization of the year's progress in Obstetrics has shown discriminating judgment in the selection of material likely to be serviceable to the medical man who wishes to keep himself perfectly informed. The first part is devoted to Pregnancy, with a very satisfactory discussion of the Abderhalden test, its limitations and applications. The Toxemia of Pregnancy, including Eclampsia, is also considered at length. Knoop is quoted to the effect that the declining of the birth-rate is brought about by a voluntary limitation of the number of children.

The second part is devoted to Labor, much space being given to pituitrin and its use and also to the question of twilight sleep.

The third section is devoted to the Puerperium; the fourth to the New-born.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month the bad weather has continued, and there have been very few hours of sunshine to relieve the monotony of the rain and slush. There have, however, been a few days of hard weather with frost at night, which has in the immediate neighborhood of London rendered the surface of the ground very sticky, and subsequently moist and muddy.

Owing to the fact that there has been very little activity in France, there has been only a slight influx of military patients as compared with previous times. Those cases which have come in have consisted, as far as my own observation goes, of indefinite pains, which are labeled rheumatism, a few mild cases of trench feet, a few cases of paratyphoid of a very mild type which have been overlooked at the front, and a few oddments such as weak hearts, bad teeth, and so forth. Most of the cases complaining of pains in the lower limbs only seem to be dependent upon corns and callosities on the feet. The pains disappear with a few days' rest in bed, during which time we have made great efforts by the aid of fomentations, scraping, etc., to get the feet into good condition. The men themselves are much gratified by this attention, and say they are more comfortable than they have been for some time previously. Considering the number of men whose teeth are now being put in order, there ought to be a slump for dental surgeons for some few years after the war.

There does not appear to be any sign of a great epidemic, although the public health authorities are inclined to anticipate it. A few cases of German measles have been seen, and the Public Health Department controlling this district have considered it advisable to include German measles in the schedule of notifiable diseases. At the beginning of this month, I had a case of German measles in an officer's home. He was in a ward with three others, and was promptly isolated. Just over a fortnight later the three other occupants of the ward developed temperatures up to 103° lasting a couple of days, for which no abnormal condition was detected. None of these three had any rash or glands.

An important discussion is taking place in the columns of one of our leading daily papers on the question of the shortage of doctors in this country, and the correlated question of the supply of doctors for the

new army. During the last few months a self-constituted and influential War Emergency Committee, acting largely under the auspices of the British Medical Association, has been active in trying to get a large number of men to join the Royal Army Medical Corps. This committee is in close touch with the authorities at the War Office. The complaints of the doctors voiced in the columns of the newspapers may be roughly divided into the following headings: (1) That the authorities are bringing pressure to bear on all medical men under forty-five years of age to join the colors. (2) That there are already 10,000 medical officers attached to the army, which is at present believed to number three millions, and that this number is in excess of that which is actually required. (3) That the organization of the R. A. M. C. needs considerable modification, especially as regards the question of the best utilization of the material at its service. (4) That the needs of the civil population are not being sufficiently considered, and that there is a considerable possibility of the occurrence of an epidemic during these strenuous times, to cope with which a sufficient number of medical men are not being left in the country. Under the first heading it may be remarked that this committee is doing its best by obtaining a census of medical men in each district, and arranging that no district shall be denuded of its medical attendants, but that only such as can be spared should be asked to join.

I have recently talked with sundry medical men and tried to gather the point of view with which they regard this question. Every one is willing to do his best, but they point out that if they leave their practices their patients will go elsewhere, and they will not be able to recover them on their return. From the point of view of the public their going away is looked upon as a source of injustice, and the remark is made, "If you go away now it is quite likely that you will go away on some other pretext another time." The bonus which the government offers at the end of a year, two years, or at the end of the war, is quite insufficient to meet their present loss. For the man whose practice is largely composed of panel patients this does not matter to a great extent, as it would be quite simple to arrange for him to receive a proportion of the fees of those patients (already much reduced in numbers) on his panel, and simple legislation could insure him having a number of patients on his return. It is, however, another thing with the man who has worked up a practice in a different class of the community. It has been suggested that the government should buy these people out, and get what they can on any future transactions. This in itself is impracticable. With regard to the second point, it is proposed to raise the number of the R. A. M. C. from 10,000 to 15,000, and it is believed that the army will ultimately number four millions. Half as many medical officers as are now in the service are therefore required to come forward. As the army is at present only to be increased by one-third, there is an obvious discrepancy, and the disproportion in these figures is not understood. The present numbers, it will be observed, allows one doctor for each 300 soldiers, whereas the new figures would mean one medical man to 266 soldiers. It is of course quite possible that the number of the present army is below that first intended, but a 4,500,000 army would be the full proportion which the country can rely upon, even under conscription, with our population, and this leaves very little over for the abnormal proportion of men who must be employed on munitions, work for export, transport, etc.

Under the third heading there are many debatable points. It is contended that medical officers are required to do a large amount of clerical work which could readily be deputed to a skilled clerk, such as non-medical details of histories, case-sheets, etc., details required in the present system of invaliding, the large amount of detail required in the ordering of diets, and the filling up of certificates in the duplicate and triplicate. The diets seem to come under considerable criticism, inasmuch as

the army administration does not accept the principle of fixed dietaries such as is usual in civil hospitals. I am told that one ingenious medical officer got over this difficulty by having rubber stamps made for the different items of the dietaries, and was able to print on the sheets the diet for the individual soldier, thus saving several minutes writing. There also seems some ground for complaint against the method in which individuals are employed. Instances are quoted where a hospital surgeon was in the trenches, whereas his late resident was further back at the field ambulance doing the operations, and a highly skilled physician was doing the work which could quite as well have been done by a man recently qualified. From the point of view of the army, the man is most useful who can be sent anywhere at a moment's notice, and the War Emergency Committee is asking the more highly trained men to offer themselves under the same conditions as those who have only recently been qualified; and in this respect is not even adopting the precautions taken by the Munitions Department. The average medical man, and the public generally, appreciate that the specialist is worth considerably more than the newly qualified man, and realize the absurdity of putting a member of a hospital staff in a position subordinate to that of the man who was recently qualified. The situation is, of course, very full of difficulties, but no doubt the solution of the problem will be forthcoming.

As regards the fourth point, there can be no doubt whatever that those remaining in this country are doing a great deal more work than in peace time, and are unable to take the holidays which are advisable for the sake of health. Residents are occupying more than one post, staffs of hospitals are overworked owing to many men being absent, the general practitioners are carrying on the practices of those who are absent, and this condition of overstrain will be made worse the more the ranks of those at home are depleted. I do not personally see why it should be anticipated that an epidemic should occur (wages are high and unemployment hardly exists), except that there are undoubtedly a number of infected soldiers being brought back to this country, such as mild cases of typhoid and paratyphoid, and cases of dysentery. It is always possible that an epidemic might arise of one of these diseases, but so far there is no sign of it. Various suggestions to improve matters have been put forward, such as the disbandment of some of the field ambulances which are training in this country, whose personnel are not (at present) employed in medical work. It is represented that in the present stationary warfare field ambulances can be dispensed with. It has also been suggested that the R. A. M. C. should be considerably reorganized with simplification of their duties in regard to the various points mentioned above. Various other schemes have also been mentioned. However, the scheme which I believe would be most acceptable to the medical profession would be one based upon an arrangement by which the R. A. M. C. provided the administration, and civil doctors in rotation carried out the professional treatment. I have no doubt that if some such scheme were adopted, every medical man in the country would be able and willing to give his services for periods of three months each year, and would not cripple himself in doing so. Any of the controlling bodies of the medical profession, such as the College of Surgeons and Physicians, or even the British Medical Association, could take in hand the organization of the civil rota, while there must be enough regular officers to provide for the administration. Another scheme was suggested by which a rota of medical men could be formed, from which any number could be drawn on a few days' notice, to meet an emergency. This does not appear to be as satisfactory as the former. Apparently, however, the War Office does not favor any other scheme than that by which the medical officers become part and parcel of the army, for a given time, or until the war is over.